ENGINEERING NEWS-RECORD

Louis V. Prentiss—Heads ARBA as new highway era begins p. 23

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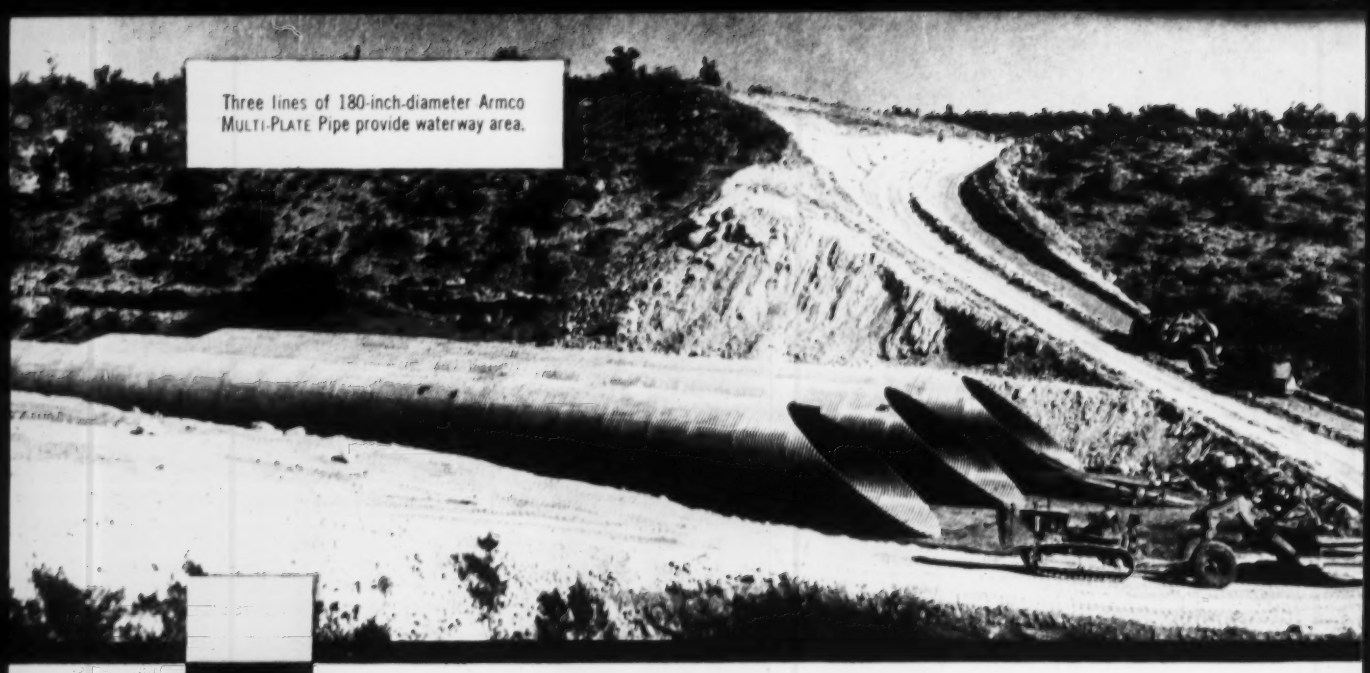

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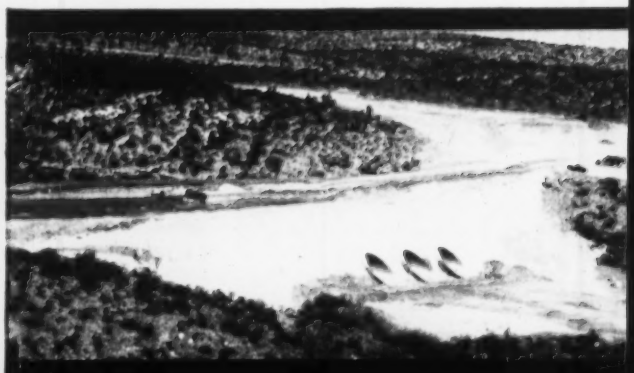

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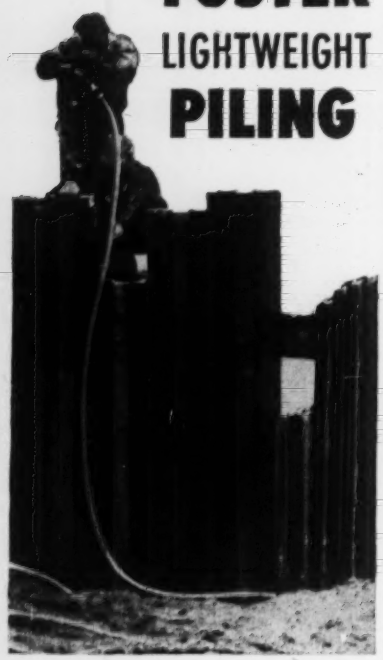

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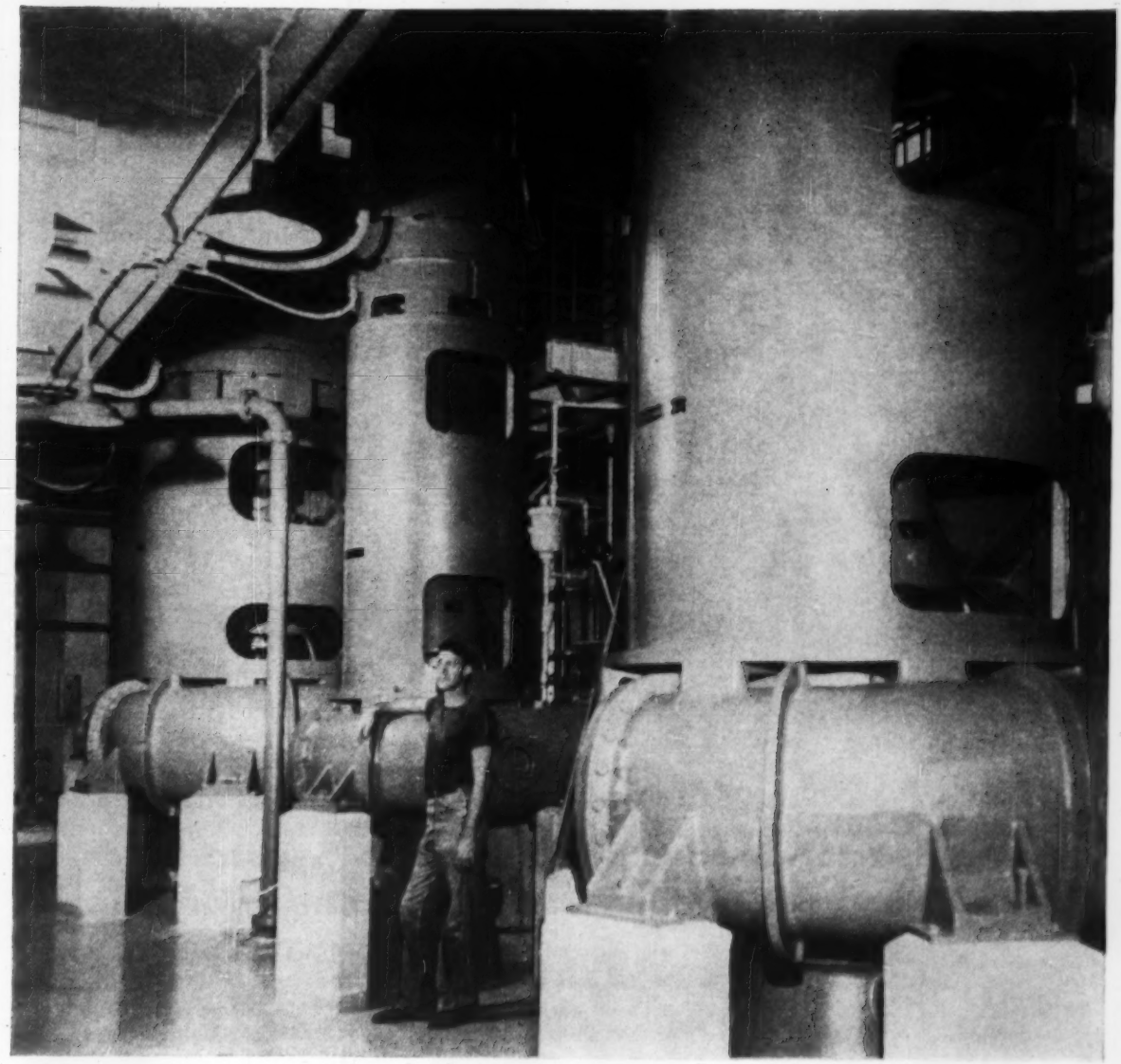

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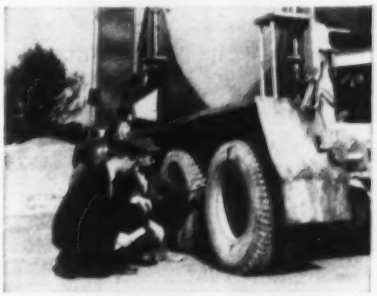

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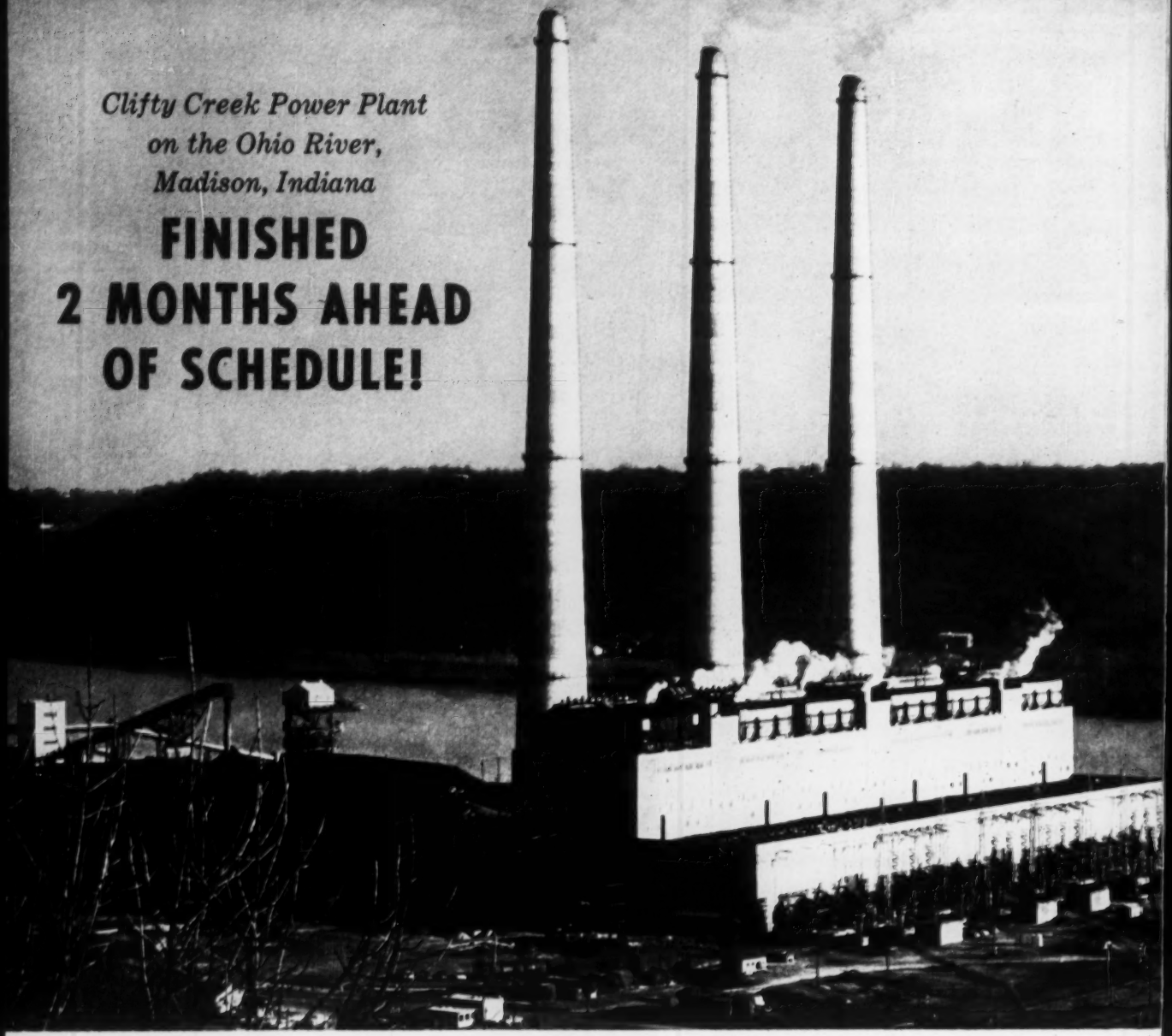

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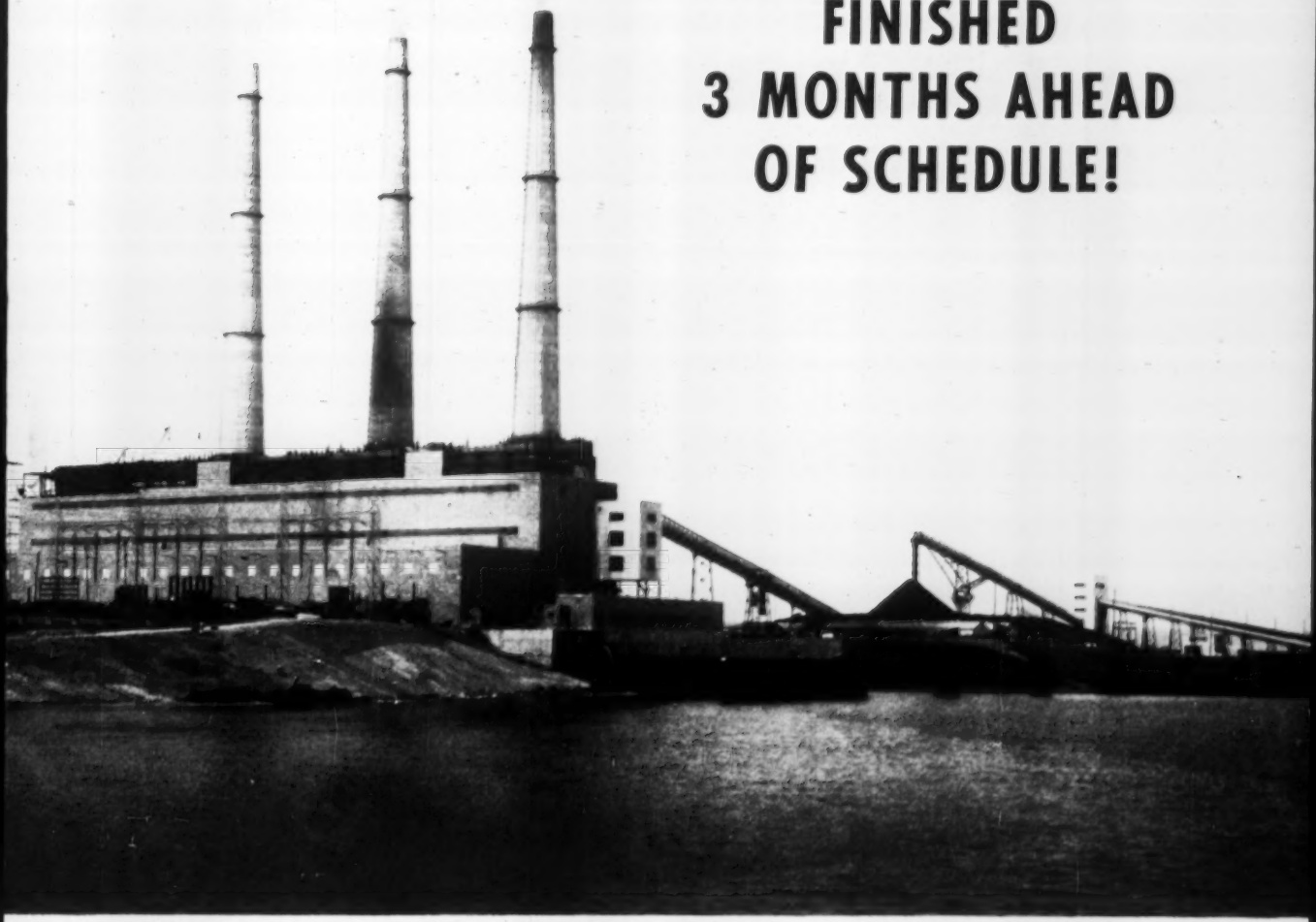

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Reader Comment

Those Priest Rapids Bids

SIR—The article in ENR Mar. 22, p. 21, "Bids for Priest Rapids", was most interesting. However, it does raise questions which we believe require further attention.

Are the best interests of the owner and of the public served by the type of "all inclusive" contract used for the Priest Rapids project?

1. Long term performance capability of the equipment installed and the ready availability of maintenance and repair facilities are of substantial importance, particularly so if any of the power used is for national defense facilities as in the case of Priest Rapids.

2. The "all inclusive" type of contract places a premium on low cost equipment, designed merely to meet minimum requirements. The general contractor, naturally, is averse to penalizing his bid by including refinements or improvements in the equipment which will increase his bid costs. Consequently, little concern is given to superior mechanical equipment, higher efficiencies, long term reliability, economies of installation and actual ability of each equipment manufacturer, as proven by his past experiences in building machines of comparable size and horsepower ratings.

3. A major generating station must operate with a minimum of outages for maintenance and repairs. This cannot be assured when the manufacturer of the equipment is located across an ocean. The penalty for late completion as set up in the specifications is $3,000 per day per unit, or $24,000 per day for the plant. With such a penalty for late completion, a comparable figure should be considered for possible plant outages.

What conclusions can be deduced from the bidding?

1. It is highly problematical that participation in the bidding by foreign manufacturers had any influence on the bidding by American manufacturers.

2. The lowest unit price covering turbines was based on American equipment at an installed price $600,000 lower than that of the general contractor who submitted the low overall bid which proposes using foreign built turbines (see p. 83 for unit prices).

3. Because labor and materials cost less abroad, the price of European equipment, including ocean transportation and duty, should be at least 30% to 40% below American prices for equipment of comparable quality. The actual bid tabulation did not reflect these savings.

There is an additional fundamental issue. Survival of the American industry is involved. Furthermore, as an important footnote, it should be remembered that federal, state and local business and income taxes are all adversely affected when an American manufacturer loses contracts to foreign manufacturers.

B. E. SMITH
President
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Engineering News-Record welcomes expression of opinion from its readers. Comment should be as brief as possible and pertinent to subjects of current construction importance.

Letters should be addressed: Editor, Engineering News-Record, 330 W. 42nd St., New York 36, N. Y.

Beauty Is Also Important

SIR—In your article "How to Get More Highway Per Dollar," ENR Mar. 8, p. 27, with the heading, "Function Not Frills," Burt A. Wilder said, "A major point is design: After all, is the bridge over the highway going to be used as a monument for future generations, or is it to be a practical, useful facility?"

The inclusion of frills in your heading would indicate unnecessary ornamentation. But to answer Mr. Wilder, such bridges should be both useful, and in a sense, a monument for future generations. In other words, they should have also qualities pleasing to the eye an in keeping with the surroundings.

In designing throughways these days the authorities have consistently made every effort to interfere as little as possible with the beauty of the country through which they pass. Surely, grade-separation bridges need as much attention as the landscaping. That the general public appreciates and demands beauty in structures is shown by the awards given in the annual Aesthetic Bridge Competition for the most beautiful bridges in the country run by the American Institute of Steel Construction. These awards are made to those bridges which in the eyes of a competent jury of nationally known architects, engineers and directors of art museums are aesthetic as well as useful and practical.

The results have been interesting in the continuing refinement of bridge design. In this direction, the bascule bridge, which originally was the ugliest bridge, has through proper design now become one of the most attractive. The steel arch bridge, and of course, the suspension bridge have brought to the traveling public an appreciation of beauty of design as well as functional adaptability.

In these annual contests, many of the bridges which Mr. Wilder probably objects to have received awards. The fact that they are being so designed and built shows that the authorities realize that they should give to the traveling public something pleasant to look at as well as something simply useful and practical.

LAURENCE MCKINNEY
Chairman of Awards
American Institute of Steel Construction, Inc.

Russian Engineering

SIR—With reference to the editorial "Confusing the Issue" (ENR Mar. 1, 1956, p. 100) I am in agreement with the thesis that the use of fear of Russia as an argument to persuade American boys and girls to take up the study of engineering is absurd. But I was not aware that this approach was being used.

However, is it not belittling the issue to draw a parallel between Olympic sports and Russian engineering education? Further, I should like to know what sources were the basis for the inferences regarding the quality and quantity of Russian engineers being graduated. Also, what is the "yardstick" to be used in defining an engineer? [EDITOR'S NOTE—That was one of the points of the editorial. There is no yardstick so why try to "compete with the Russians on their own specifications."]

As regards the quality of Russian engineers, it is probably true that they are trained in engineering at the cost of their general education and that the training is confined to narrow specializations. This is, of course, in keeping with the Soviet premise that the purpose of education is to train the individual for the particular purpose the State requires. However, such people as Lewis L. Strauss, Chairman of AEC, and Admiral H. G. Rickover state that Russian engineers are well trained and highly competent, and that their first rank men appear to be as good as our own.

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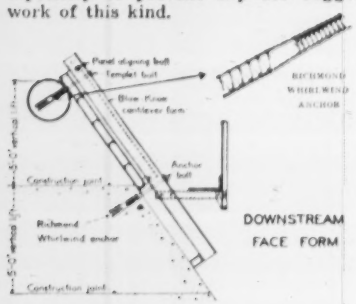
Massive Pours

Merritt-Chapman & Scott and The Savin Construction Corp., contractors, used 55,800 Richmond Whirlwind Anchors without slip or spall in this vast dam construction at American River, Folsom, California.

Economies with Richmond Whirlwind Anchor

In dam construction like the above, considerable speed and economy are to be gained by pouring successive monoliths in 5 ft. lifts into steel cantilevered forms. Success of this money-saving method depends, however, on one-point form anchorage that will positively withstand massive overhead pours and loads imposed from all directions. Richmond's *Whirlwind* anchor was designed especially to prevent slip for rugged work of this kind.



These Richmond anchors are mounted on the form before each monolith is started. Installation is easy. The *Whirlwind* is made with double coils, one coil takes the form bolt, the other supplies added anchorage to prevent slip in concrete during its low early strength period. There is no spalling. Richmond's development of these special anchors has been in large part responsible for the constantly increasing popularity of this fast, more economical, anchorage and pouring method.

For more information, or a copy of the Richmond Handbook of tying devices, anchorages and accessories for concrete construction, write: RICHMOND SCREW ANCHOR COMPANY, INC., 816 Liberty Ave., Brooklyn 8, N. Y. or 315 S. 4th St., St. Joseph, Mo.

work by the Office of Scientific Personnel of the National Research Council of the National Academy of Sciences, is considerd to be the most thorough and complete study to date of the educational system of the Soviet Union for the training of scientists and engineers. This study states that the Soviet Union has made tremendous strides toward building up its specialized manpower resources. As a result of its efforts, it has reached a position of close equivalence with or even slight numerical supremacy over the United States as far as the supply of trained manpower in specialized professional fields is concerned. The Soviet effort continues.

Is it not a dangerous brand of nationalism to assume that our scientists and engineers are naturally better than the Soviet product and that we can ignore Russian educational efforts? It seems to me that we should get all the facts we can and widely publicize them, not to create fear, but to provide a base for action. Only through knowledge of the overall situation can we make certain that our young people are being adequately trained for the demands of our modern world.

F. J. JEFFERS
Baltimore, Md.

Accuracy Is Variable

SIR—We have noted with interest the letter of Professor C. Miller (ENR, Mar. 8, p. 11) entitled "Photos Offer High Accuracy", commenting on the article on the use of photogrammetry to measure deformations of structures (ENR, Jan. 26, p. 38), in which he dealt particularly with the accuracy obtainable by photogrammetric methods. Some clarification is needed.

The original paper "Photogrammetric Measurements of Deformations of Structures" by C. Moser and W. R. Schriever on which your article was based, contains extensive information on the accuracy of photogrammetric measurements. This was omitted in the ENR article.

As an example of the accuracy obtained, the deflection of a simple beam under load was determined photogrammetrically and with dial gauges. Under the conditions stated in the paper, the difference of measurements between the two methods amounted to 1.2% only of the actual deflection for a distance of 60 feet. Under less favourable conditions, however, (greater distance, unsatisfactory illumination, lack of contrast) the accuracy obtained was not so high. This is the reason why in structural testing in the field, where favourable conditions cannot always be guaranteed, the accuracy is limited.

The example mentioned by Professor Miller of work done by Professor M. Zeller of the Swiss Federal Institute of Technology on corrosion in water pipes is not directly comparable. The example is taken from the field of microphotogrammetry. The photographs were taken in a high pressure water pipe with artificial illumination and with a magnification of 10. In structural testing one has frequently to rely upon daylight which in many cases is not entirely satisfactory and the object appears in a very reduced scale on the photographic plate. Thus, the accuracy of measurements cannot be the same as in case of microphotogrammetry.

We are grateful to Professor Miller for bringing up this important aspect of the use of photogrammetry in nontopographic fields.

C. MOSER AND W. R. SCHRIEVER
National Research Council
Ottawa

CALENDAR

Society of American Military Engineers, 36th annual meeting, Washington, D. C., May 14-15.

Purdue Industrial Waste Conference, Purdue Memorial Union, Lafayette, Ind., May 15-17.

American Institute of Architects, annual convention, Biltmore Hotel, Los Angeles, Calif., May 15-18.

Prestressed Concrete Institute, second annual convention, Hollywood Beach Hotel, Hollywood, Fla., May 16-18.

Society for Experimental Stress Analysis, spring meeting, William Penn Hotel, Pittsburgh, Pa., May 16-18.

Building Research Institute, annual meeting, Sheraton-Brock Hotel, Niagara Falls, Ont., May 21-22.

National Society of Professional Engineers, Ambassador Hotel, Atlantic City, N. J., May 23-26.

Concrete Reinforcing Steel Institute, annual meeting, The Greenbrier, White Sulphur Springs, W. Va., May 28-June 2.

Steel Joist Institute, annual meeting, The Greenbrier, White Sulphur Springs, W. Va., May 29-30.

American Society of Civil Engineers, spring convention, University of Tennessee, Knoxville, Tenn., June 4-8.

Materials Handling Exposition, Cleveland, Ohio, June 5-8.

World Conference on Earthquake Engineering, University of California, Berkeley, June 12-16.

American Society for Testing Materials, annual meeting, Chalfonte-Haddon Hall Hotel, Atlantic City, N. J., June 17-22.

American Society of Landscape Architects, 57th annual meeting, Cleveland Hotel, Cleveland, Ohio, June 24-27.

How to switch "rigs" on the go... get "four-for-one" machine utility!

From the seat and on-the-go you instantly get any material-moving action you need with an International® Drott® Four-In-One!

You'll be cascading dirt in dozer position and suddenly need carry-type scraper action. Touch the "machine selector" lever with finger-tip ease, and you have it—to grade, strip, or spread with accurate clam lip control!

Touch! again, for Skid-Shovel position. And with exclusive Drott triple-power, pry-over-shoe break-out action, you can be tearing up and loading stuff as tough as concrete pavement—often where even a power shovel fears to tread!

Touch! once more—and a fast-working clamshell can be gulping aggregate in a space barely big enough to contain your outfit! And giving you a "hopper-high" dumping reach, 30 inches above ordinary roll-forward buckets!

Prove to yourself a Four-In-One will save uncounted hours of changeover time—give 4-machine utility for one moderate investment. Now available in 3 sizes: 1-yard to 2¼-yard capacity, all with the built-in protection of exclusive, shock-swallowing Hydro-Spring. Ask your International Drott Distributor for a Four-In-One demonstration!

Material-Loosening Scarifer Attachment! It's simple to install this scarifer attachment, to speed straight-forward bucket loading. The third or extra valve (which is standard equipment on all Drott Skid-Shovels) is used in this operation. This hydraulic-controlled scarifer has deep penetration, and strength for hard materials. See and try it!

International Harvester Company, Chicago 1, Illinois
Drott Manufacturing Corp., Milwaukee 8, Wis.

INTERNATIONAL®
DROTT

NOW.

to match the new

1. Side plates are of abrasion resistant high strength steel, securely fused to moldboard and box sections by low-hydrogen welding. They prevent load spillage, allow you to carry larger loads. Standard on all International bulldozer blades.

2. Push arms are sturdily constructed of box sections. Side plates are mill-rolled with integral back-up bars to support top and bottom plates. Machine welding guarantees uniformity of weld.

3. Headless pins, locked by eye bolts, secure struts to blade. For removal, pins can be driven out in either direction. On hydraulic blades, all control linkage is connected to the blade through self-aligning bearings.

4. Entire perimeter of blade is backed by heavy box channels solidly fused to moldboard. With this type of construction moldboard, box channels, and welds flex freely to prevent weld failure.

5. Spillboard is wide and high to prevent spillage over top of blade. Note that it is curved to match the contour of the moldboard, thus aiding boiling action. Width of moldboard allows you to carry full load for which the blade was intended.

6. Moldboard is formed from a single sheet of low-alloy, high-strength steel. International blade is shaped to perfect curvature in a special forming machine to assure uniform strength and stress resistance over entire area.

7. Shear bars welded to moldboard support end bits and relieve stress on end bit bolts. Lower edge of end plate is reinforced by wear plate to add strength at corners, increase wear resistance.

New blades designed from "ground" up

To make full use of the greater work capacity of the new Bonus-Powered International crawler tractors, we now offer a complete line of newly designed blades matched to tractor power.

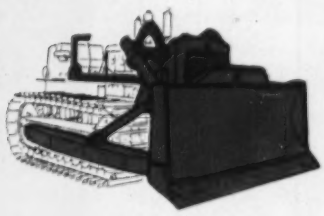
These new blades are rigidly supported around the edges by box sections to give the blade strength but also permit the moldboard to "breathe" under load stresses. New automatic welding processes guarantee that the welds in International blades will hold up under *any kind of job conditions.*

International blades will last far longer and give you far less trouble than any others you have ever hung on any tractor. When you inquire about the new line of Bonus-Powered International crawler tractors, ask your International Industrial Power Distributor for all the facts about the new line of matching blades. See for yourself that they are the best designed, best constructed on the market.

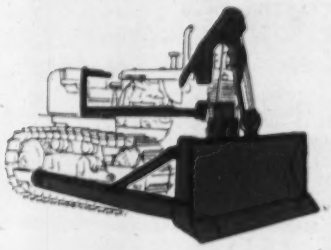
Write For New Blade Literature: An illustrated specification list of the *228* attachments available for International crawler tractors is just off the presses. For your free copy of Mailing Folder CR-492-F, write Consumer Relations Department, International Harvester Company, 180 North Michigan Avenue, Chicago 1, Illinois. No obligation, of course.

.42 new blades

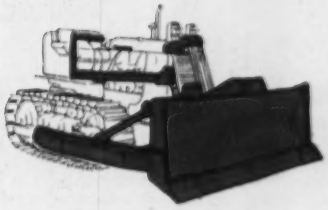
Bonus-Powered International crawlers



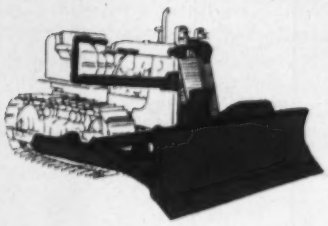
Direct Lift Hydraulic Bulldozer
Operates off front-mounted, gear-driven pump which gives fast blade action. Self-aligning bearings prevent binding of linkage.



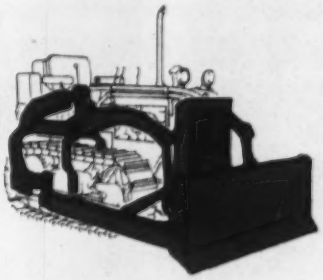
High-Gantry Cable Bulldozer
Operates off either front or rear-mounted International cable control unit. Available for TD-24, TD-18, and TD-14 tractors.



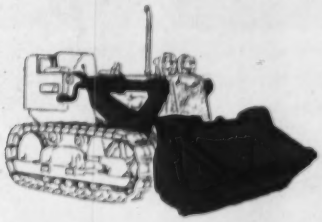
Low-Gantry Cable Bulldozer
Operates off either front or rear-mounted International cable control units. Available for TD-24, TD-18, and TD-14 tractors.



Hydraulic or Cable Bullgrader
Operates off high or low gantry, front or rear cable controls on TD-24, TD-18, and TD-14 tractors. Hydraulic bullgrader also for TD-9, TD-6, and T-6 tractors.



Track Frame Mounted Bulldozer—Distributes the load evenly over the length of the tracks. Available only for TD-9, TD-6, and T-6 tractors. Bullgrader also available.



International Drott "4-in-1"
Newest of International Drott loaders. Combines Skid-Shovel, Bull-clam, clamshell, and bulldozer in one unit. Available for TD-14, TD-9, and TD-6 tractors.

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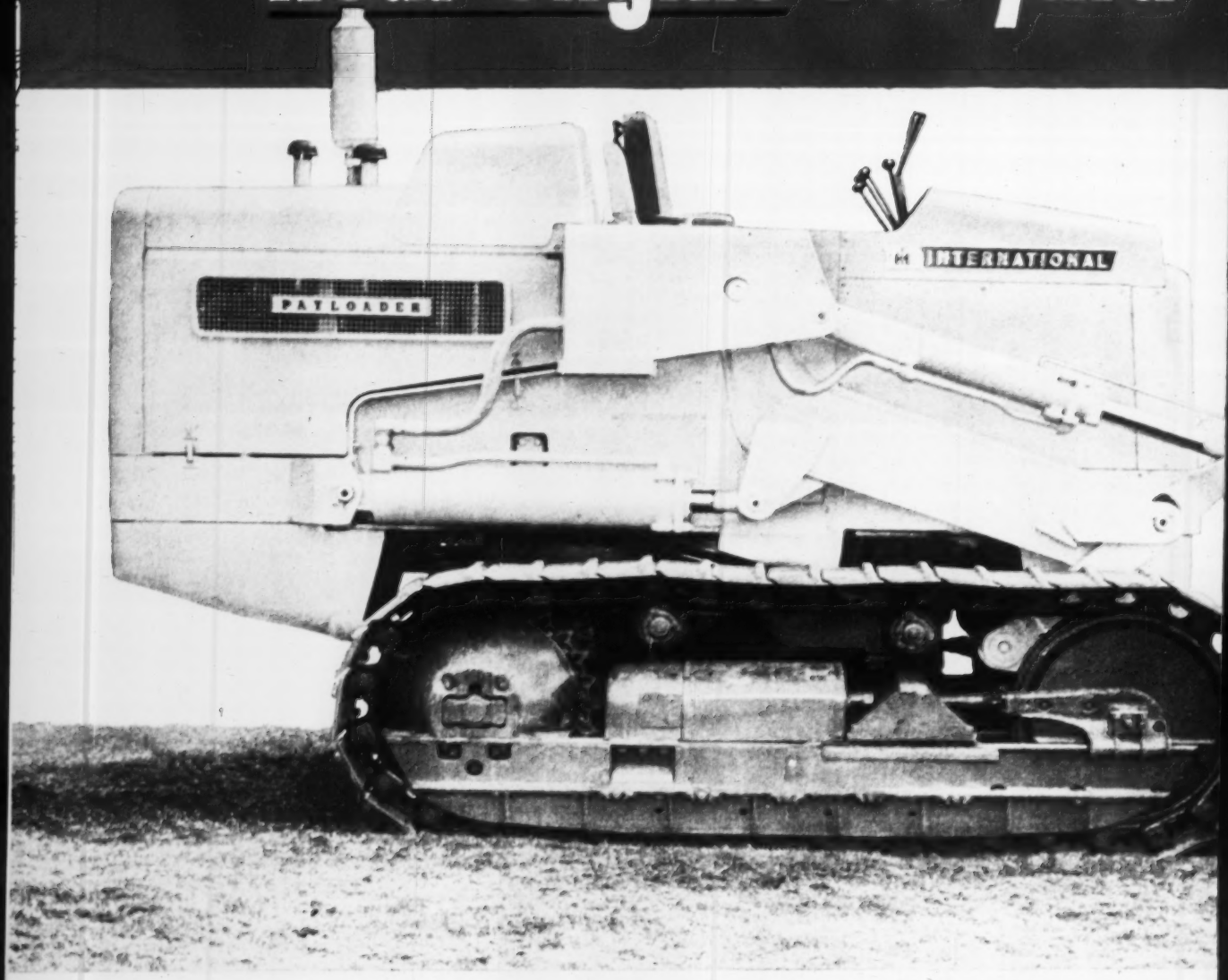
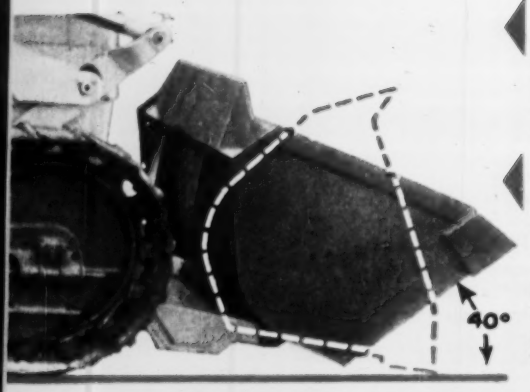
180 N. MICHIGAN AVENUE—CHICAGO 1, ILLINOIS

A COMPLETE POWER PACKAGE INCLUDING: Crawler, Wheel, and Pipe-Boom Tractors . . . Self-Propelled Scrapers and Bottom-Dumps . . . Tractor and Rubber-Tired Loaders . . . Diesel and Carbureted Engines

AMAZING!...NEW!...

Rear-engine 1¾ yard

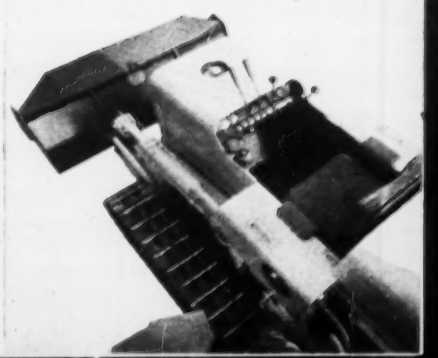




PRY-OUT BUCKET ACTION: Tremendous 17,500-lb pry-out force is obtained by using break-out pads on ground as fulcrum for leverage. This transfers load forces to ground instead of to machine.

40° BUCKET TIP-BACK AT GROUND LEVEL permits digging of bigger bucket loads, *plus* retaining of more of load in bucket during lifting and carrying.

OPERATOR SITS COMFORTABLY in foam-rubber seat, handles conveniently-placed, power-boosted controls, can see load and cutting edge at all times.



International® Payloader®

- **New—this highly-maneuverable crawler tractor-loader with "power-shift" transmission teamed with Torque-Converter advantages—to give you maximum possible material-moving capacity and speed in any given condition.**
- **Operator sits up front, close to bucket, can always see what he's loading, where he's going.**
- **Speed unmatched in crawler history, 10 mph forward, 13 mph reverse, provides faster cycles.**

If it's *speed* and *maneuverability* and *big capacity* you want in a crawler-loader, see the new International 1¾ yard Model 12 Payloader!

This amazing new 91½ hp loader seats its operator *in front of the engine*, up close to the bucket, where he has an unobstructed view of everything from cutting edge to toe of bank. It balances the tractor between rear-mounted engine and front-mounted bucket. Weight is evenly distributed over entire length of tracks. You get better traction, longer track life, better stability on grades, less bogging down in spongy ground.

Your operator moves faster on this new Payloader, too. He can go up to 10 mph forward, 13 mph in reverse. He changes speeds or direction instantly through a full-power shift, three-speed transmission. No waiting, no stopping, ever! *All* shifts through *all* speeds can be made in either forward or reverse under full engine speed WITHOUT SLOWING DOWN. Torque-converter gives you maximum digging-power for the toughest jobs. (Operation gets *another* boost from the torque converter . . . it provides an infinite range of speeds, automatically selecting the one which best balances load and torque.) Steering is a finger-tip cinch, too, because each *steering clutch* and *brake* is controlled by one power-boosted lever *only* (no foot steering brakes).

Try this new International Model 12 Payloader for yourself. Your International Industrial Power Distributor will be glad to demonstrate. Call him soon! A good deal awaits you!

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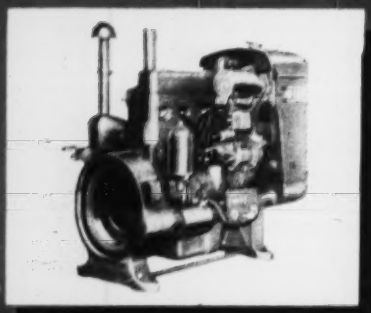
A COMPLETE POWER PACKAGE INCLUDING: Crawler, Wheel, and Pipe-Boom Tractors . . . Self-Propelled Scrapers and Bottom-Dumps . . . Tractor and Rubber-Tired Loaders . . . Diesel and Carbureted Engines

To get the advantages that only 54 years of engine

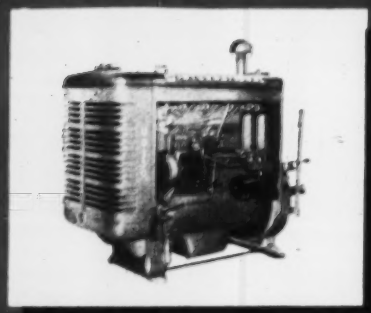
standardize on International

Here are 5 typical members of the International family of 15



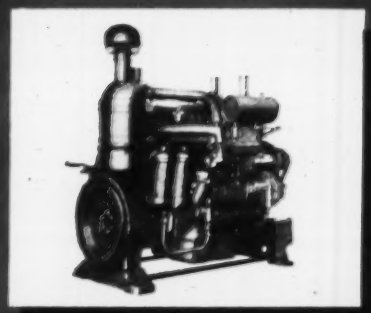
U-169

U-169, rugged 4-cylinder 48.6 hp valve-in-head carbureted unit, delivers top performance on "regular" gasoline. Can be adapted to burn LPG, natural gas, kerosene, or distillate. Ideal for compactors, ⅜-yd excavators, water well drills, fork lifts, rotary snow plows, 12 to 15 kw generators.



UD-350

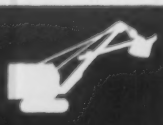
UD-350, 4-cylinder diesel develops 78.5 bhp as an engine, 75 bhp as a power unit shown above. Available in air compressors, bucket loaders, asphalt mixers and driers, ½-yd shovels and cranes, portable screening plants, 25 to 40 kw generators, hoists, graders, pumps, and trenchers.



UD-525

UD-525, 6-cylinder, 121 bhp diesel with all-weather push-button starting as standard equipment. Available with 14 major attachments, including 43-gal fuel tank, muffler, skid-type subbase. Fits 29 different excavators, graders, compressors, other construction tools.

International power units in various modifications are engineered to team with all these machines:



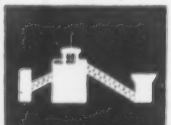
Shovels, Cranes, Draglines
17 Manufacturers

Motor Graders
5 Manufacturers

Air Compressors
5 Manufacturers

Road Rollers
4 Manufacturers

Asphalt Mixers and Pavers
6 Manufacturers



Crushers
5 Manufacturers

Fork Lifts
3 Manufacturers

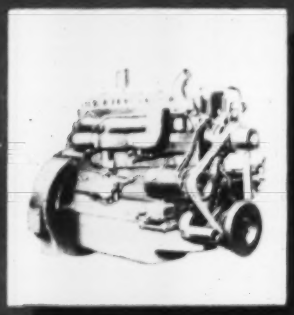
Generators
5 Manufacturers

Trenchers
3 Manufacturers

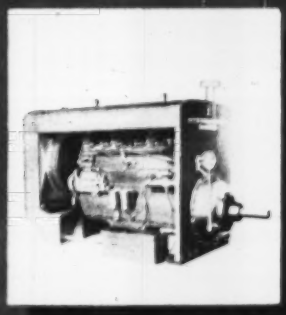
Pumps
12 Manufacturers

leadership can give . . .

Engines



U-450



UD-1091

U-450, one of the most popular 6-cylinder carbureted engines on the market today for trucks, water well drills, 35 to 50 kw generators, graders, ¾-yd shovels and draglines, big rotary snow plows, ditchers and trenchers. Develops 118.5 belt horsepower.

UD-1091, diesel, largest of the 18 International engines, develops 214 bhp, provides exceptional fuel economy for 34 different makes of construction units, including 2 to 2½-yd shovels, 8-cylinder compressors, large asphalt plants and 75 to 100 kw generators.

Engine Model	Displacement (Cubic Inches)	Horsepower (with full equipment less fan)
CARBURETED ENGINES		
U-1	60	17 @ 2500
U-123	123	31.2 @ 2000
U-169	169	48.6 @ 2000
U-264	264	53.5 @ 1600
U-220	220	64 @ 2400
U-240	240	66.5 @ 2400
U-282	282	79 @ 2400
U-372	372	96.5 @ 2200
U-406	406	104 @ 2200
U-450	450	118.5 @ 2200
U-1091	1091	214 @ 1600

Engine Model	Displacement (Cubic Inches)	Horsepower (with full equipment less fan)
DIESEL ENGINES		
UD-264	264	57.5 @ 1800
UD-350	350	78.5 @ 1800
UD-14A	461	100 @ 1800
UD-525	525	121 @ 1800
UD-140-D	525	141 @ 2300
UD-18A	691	131.5 @ 1600
UD-1091	1091	214 @ 1500

In most fields, you'll probably agree, you get the most for your money from the company that's been a leader *for the longest time.*

In engines and power units, the outfit to turn to for longest leadership is International. Since starting manufacture in 1902, International has built and sold *millions of engines* for heavy-duty work! In these 54 years, International has pioneered in developing and perfecting many of the features you consider essential today. Valve-in-head design . . . all-weather diesel starting . . . replaceable cylinder sleeves . . . tocco hardening . . . lubrication through drilled passages . . . precision type bearings . . . full-flow oil filters, to name a few.

These cost-cutting features are backed up with such added advantages as:

Honest horsepower ratings at speeds you can use.

Easy installation with attachments to fit whatever jobs you have.

Fully-experienced sales engineers to help you select and install the engine which best does your work.

Unmatched adaptability, with the same basic engine available as regular or optional power with various modifications in many kinds of equipment (one typical International engine, for instance, fits an International crawler tractor *and 46 makes* of loaders, compressors, asphalt mixers, pavers, excavators, generators, pumps, graders, and rollers). When you power with International, this ready adaptability lessens your parts inventory . . . simplifies and speeds operator training . . . makes your servicing problems a lot easier!

International engine owners get another tremendous benefit, too. To help them is one of the most experienced heavy-duty engine parts and service organizations in the world. At your service are 11 giant regional *parts depots,* 173 Industrial Power *Distributor* locations, *and* hundreds of Power Unit *Dealers.*

To get all these big profit-making advantages, be sure to specify International power. See your nearest Distributor or Dealer for all the facts.

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A COMPLETE POWER PACKAGE INCLUDING Crawler, Wheel, and Pipe-Boom Tractors . . . Self-Propelled Scrapers and Bottom-Dumps . . . Tractor and Rubber-Tired Loaders . . . Diesel and Carbureted Engines

NO MATTER HOW YOU FIGURE IT...

When you undertake the purchase of a new pipeline for your water supply system, do you figure from the financial angle—low first cost, economical installation and a long life for your investment?

Or are you more interested in the construction of the line—minimum excavation, easy assembly, and watertight joints in a pipe strong enough to withstand high pressures and heavy external loads?

Then, again, your specialty may be maintenance. In that case you probably figure minimum repairs through freedom from breaks and leaks to be of paramount importance.

Or is your main concern with operation? If so, you no doubt figure permanent high carrying capacity, low pumping costs and trouble-free service to be vital.

Still, *no matter how you figure it*, your best answer will always be LOCK JOINT CONCRETE PRESSURE PIPE, because it most nearly approximates the ideal pressure pipe for water works systems.

LOCK JOINT PIPE CO.

East Orange, New Jersey

Sales Offices: Chicago, Ill. • Columbia, S. C. • Denver, Col. • Detroit, Mich. • Hartford, Conn. • Kansas City, Mo.

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Back issues of ENGINEERING NEWS-RECORD *are generally available for the previous six months. Price 35¢ each copy except Annual Cost Issue. Semi-annual indexes will be sent on request.* ENGINEERING NEWS-RECORD *is also indexed in Industrial Arts Index and Engineering Index.*

THE CONSTRUCTION WEEK

$11-BILLION WATER PLAN—California state officials last weekend released details of a master water plan that has been in preparation for nine years. Project proposals costing an estimated $11.3 billion include 33 major reservoirs totaling 48,000,000 acre-ft of storage. The plan is keyed to "the California aqueduct system," a network of conduits that takes water from areas of surplus to areas of need. It also includes the giant Feather River project. Of particular significance is the attention paid to local water developments that are necessary to gain statewide support for the pro-

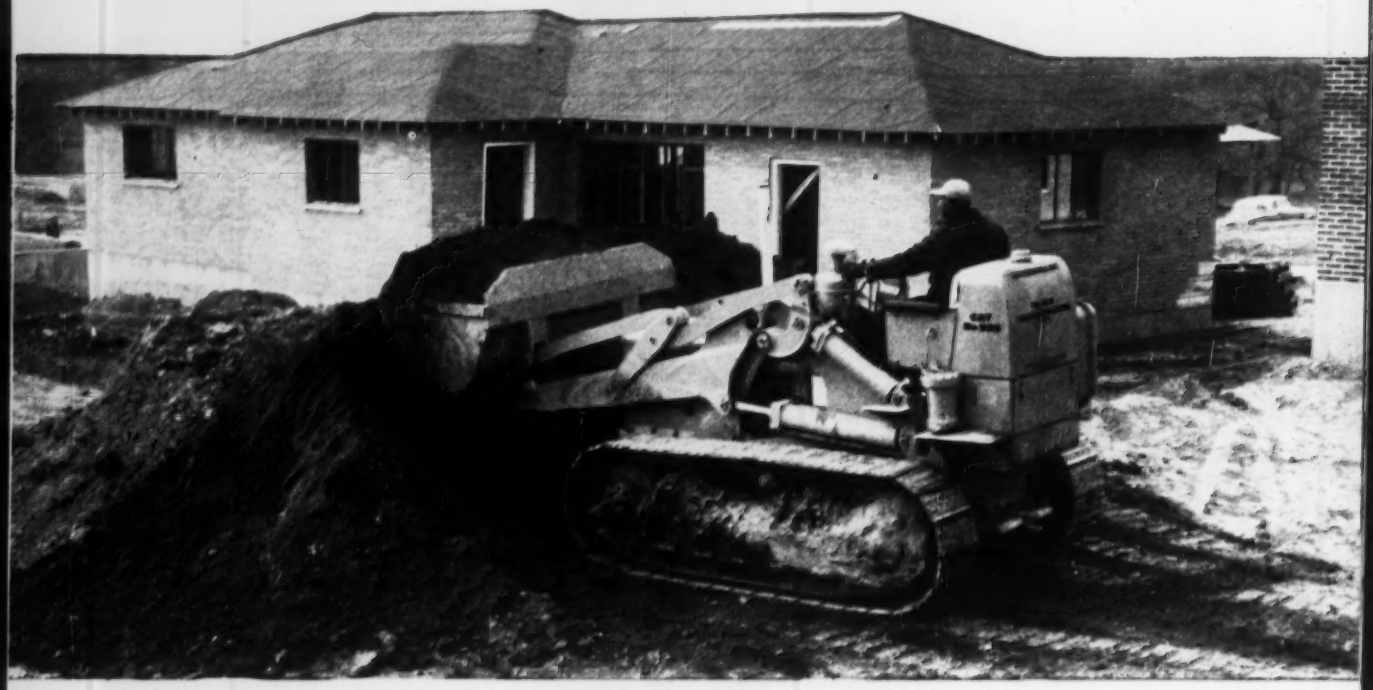
THAT TEMPTING FEDERAL AID—If the state were willing to use federal aid funds for the purpose, Ohio Turnpike Commission Chairman James W. Shocknessy would just as soon see the proposed $300-million-plus Cincinnati-Conneaut tollroad project (see page 27) scratched. Ohio, under terms of the federal highway bill passed by the House, would get $411.4 million in the first four years of the 13-year program. But, State Highway Director S. O. Linzell doesn't want the Turnpike Commission to get off that easy. Linzell favors tollroad construction at the two ends of the proposed turnpike route "where need is greatest." He contends that building the turnpike with federal funds would mean ignoring too many other state highway needs.

CUT-RATE TOLLS FOR TRUCKERS—Attitude of the Ohio Turnpike Commission, of course, is influenced partly by financial difficulties with its existing facility across northern Ohio, use of which has been resisted by the truckers. The commission has received a report from J. E. Greiner Co., its consulting engineers, recommending a 10% discount for large commercial users. And, it has signed a $16,500 contract with Coverdale & Colpitts to make a toll rate survey.

WATERWORKS NEEDS—The nation needs to nearly double its investment in waterworks by 1975, according to a report just issued by the Commerce Department. The department claims it would cost $4 billion just to wipe out inadequacies in present water systems, and another $9 billion over 20 years to expand public water supplies to meet the growth in domestic, commercial and industrial demands over the years to 1975. In totals, the report calls today's investment $22.8 billion and pegs 1975's need at $35.7 billion.

WASTE TREATMENT AID—A new Pennsylvania law gives private corporations the right of eminent domain for acquisition of property needed to comply with state orders to build industrial waste treatment plants.

On housing development jobs...



the No. 955 Traxcavator* pays its way

From digging basements to building streets and grading lots, the new CAT* No. 955 Traxcavator is a bear-cat for work, a money-maker for contractors.

The machine shown here is owned by R. & M. Construction Co., St. Louis, Mo. Working on an 83-home project in the Crestwood area of St. Louis, the No. 955 is in constant use, forming subgrade for streets, digging sidewalks, backfilling foundations, spreading and grading topsoil. Mr. Howard Skinker, Master Mechanic and Grade Foreman, says: "This new No. 955 is a big improvement in tractor shovels. The increased visibility and new bucket mechanism make it a much more valuable machine."

The No. 955 is one of three new Traxcavators in the Caterpillar line. Its bucket capacity is 1½ cu. yd. The No. 933 has a 1-cu.-yd. bucket; the No. 977, 2¼-cu.-yd. All three machines have balanced weight, traction and power to dig in hard material. They lift loads surely and quickly and are easy to maneuver. One-hand bucket operation and a comfortable seat set high for visibility give the operator a break. There's a long-lived, trouble-free oil clutch of proved superiority. The 40-degree bucket tilt back at ground level assures full loads at every pass.

If you're looking for the right unit to meet your excavating and loading needs, ask your Caterpillar Dealer for a demonstration right on your job. You can trust his trained service men and factory parts to keep your Cat equipment in top working order.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR*

*Caterpillar, Cat and Traxcavator are Registered Trademarks

MODERN HEAVY-DUTY EXCAVATING EQUIPMENT

WASHINGTON OBSERVER

The 40,000-mi interstate highway network has gotten an okay from the Senate Public Works Committee. What has happened is this: The House approved a $24.7 billion in federal funds to be spent on the interstate network over a 13-year period. Now the Senate committee has gone along with the House, insofar as the interstate network is concerned.

The big difference is in the method of allocating federal funds. For the interstate system, the House follows the Administration by adhering to a formula that allots the money to the states on the basis of need: If the cost of completing a state's interstate mileage is 5% of the cost of completing the total interstate system, then the state gets 5% of the funds allocated each year. The Senate committee approved the formula of the Gore Bill, based on population, area, and post-road mileage.

Next move is up to the Senate Finance Committee which takes up the revenue-raising features important to both versions.

•

The Niagara Falls version of the private vs public power fight is up this week again as the Senate debates and votes on the $400-million project. The issue is Sen. Lehman's bill authorizing the New York State Power Authority to do the job—which is opposed by Sen. Ives.

Chances for final approval of any legislation are slim. The reason is that—even with Senate approval the House still has to start on a bill right from scratch. Three years ago the House passed a bill authorizing private utilities to develop the power—which was effectively stopped in the Senate when Gov. Dewey came to Washington to oppose this bill before the Senate committee.

•

Liberalizing terms for home buyers is practically a fad in Congress. The House Banking and Currency Committee, in the hearings that began this week, will see a variety of schemes designed to make homes more salable by whacking down payments and stretching out maturities.

Chairman of the Veterans' Affairs Committee offers in his bill provisions which would liberalize FHA terms so they would be about the same as vets now get under the VA program. Down payments would range from 2% on loans of less than $10,000 to 15% on loans from $24,000 to $30,000.

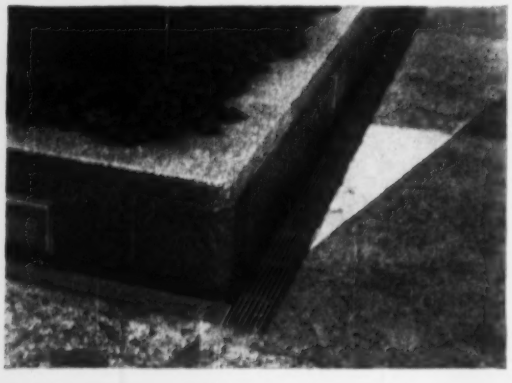
Only about one million World War II vets are potential home buyers now, says Chairman Teague—and he'd like to see FHA take over all the housing program as one way of getting at what he thinks have been abuses under the special veterans housing projects.

•

AFL-CIO Building Trades Department officials decline to act on a request to drop their opposition to state labor mergers until they receive a formal notice from AFL-CIO President Meany. The Meany-led AFL-CIO Executive Council failed for weeks to advise the craft union department of its action, though Building Trades declines to act until the formalities are observed.

The Building Trades stand has produced results in Detroit, the AFL group voted to slow down merger with the state's CIO body at the request of the Building Trades Department until the jurisdictional issue has been worked out. The department suggested a slowdown on state mergers until a formal jurisdictional pact has been worked out with industrial unions on plant construction. This brought the Executive Council's reprimand and the orders to call off the opposition (see page 120).

BORDEN ALUMINUM GRATING IN NEW MELLON SQUARE PARK . . .



PITTSBURGH, PENNSYLVANIA

Encircled in the picture above is one of several aluminum grating air vents in use throughout the park as air exhausts for the multiple-level parking area below ground.

The arrows indicate two of the locations of a system of drain trenches in existence throughout the park.

The grating installed is Borden Pressure Locked Aluminum Grating. This was an exacting job, one where only standards of quality equal to Borden's would do. Functional beauty and low maintenance are but two of the many advantages of Borden's Pressure Locked Aluminum Grating.

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Second ARBA Study Reveals:

- Design productivity can keep up with demand
- Cement and steel output will increase in phase
- Contractors can double their output now
- Labor force is more than sufficient for need
- Equipment, in use and producible, will meet requirements

New Roadbuilding Plan Can Be Met

Vincent B. Smith
Washington Staff

America's roadbuilders have the capacity to double the volume of highway construction in the next few years. Further, they can step up roadbuilding to this higher level with full confidence that materials producers and equipment manufacturers will be able to supply all potential highway needs in addition to the booming demands of all other construction.

These conclusions, announced this week, are the result of an intensive reexamination of industry capacity by four permanent task forces of the American Road Builders Association. The new studies confirm and strengthen—on a broader and deeper base—the results of the initial surveys completed by the same four teams more than a year ago.

Those earlier (January 1955) findings became suspect, however, when nationwide steel shortages and regional cement shortages hit the construction industry during the year. A second intensive survey was needed, and the task forces got busy on it last fall. As before, each task force tested the existing and potential capacity of its assigned roadbuilding component: engineering, materials, construction contractors, and equipment manufacturers. Here's what they found:

• **Engineers can handle**—Engineering is the controlling element that determines the rate of growth in roadbuilding capacity, said the task force. Luckily, there is more than enough predictable increase in productivity of existing engineering staffs to take care of the projected highway expansion.

This conclusion can be drawn from Table A, taken from the ARBA's summary of its four task force reports. This table projects a four-year growth in engineering ability to handle overall highway programs that step up from $6.5 billion this year to $10 billion in 1959. This increase in productivity is reasonably attainable with little or no expansion of present engineering personnel, in the opinion of the planning and design task force.

• **So can others**—Other components of the roadbuilding machine have even greater capacity for increased productivity. Starting off with bigger potentials for supplying the construction needs of overall highway programs, the materials producers, roadbuilders and equipment people could comfortably take care of a $7-billion program this year and an $11-billion program three years hence.

In arriving at these estimates of increased capacity for highway construction, the ARBA task forces made allowances for continued growth in other segments of the construction economy: industrial, commercial and residential building, schools, hospitals, water supply, sewerage, natural resources development and all the rest. In estimating portland cement available for highway work, for example, the cement requirements of all other construction were first taken care of. The remaining production capacity of cement plants is slightly more than enough to supply highway needs this year, plus increases in plant capacity now on the way that would be ample to take care of a $7.8-billion highway program in 1957 and an $8.5-billion program in 1958.

After 1959, when production capacity for cement is expected to top 400,000,000 bbl, as compared with 326,000,000 bbl this year, the task force forecasts a sufficient supply to meet all anticipated construction requirements, including a $9-billion highway program of conventional pattern on composition. However, construction planning can be replaced to spread cement demand into later years and assure adequate materials for an $11-billion expenditure by 1959.

(Continued on page 24)

L. W. Prentiss: New Man for the New Era

In taking over the American Road Builders Association, Maj. Gen. (Ret.) Louis W. Prentiss heads up a group which has played an outstanding role in convincing the nation that the biggest possible road program is none too large for its needs.

The task force report on this and succeeding pages is only a part of the effort of ARBA to provide those responsible for committing the country to an expanded federal highway program with necessary data and guidance.

How important that effort has been is reflected by Rep. George H. Fallon, author of the bill now under consideration. Said Fallon, ("Representatives) from the road construction industry have pointed out the ability of that industry to expand adequately in all phases to handle the job. They . . . stressed the importance of authorizing the whole program now in order to avoid the possibility of inefficient and expensive build-ups and let-downs which otherwise might occur and thus interfere with the orderly planning and prosecution of a program of this magnitude. Accordingly, the authorizations are spread over a long enough period to complete the job efficiently."

But for Prentiss and the ARBA, the promotion of the bill and the task force reports are only the groundwork. Both now face the new era in roadbuilding when expenditures for highways will be doubled and tripled and when the construction industry must meet mounting challenges to its capacity and ingenuity.

• **Spending paces work**—Last year's ARBA report faced up to the problem of a ten-year roadbuilding program to meet total highway needs of $101 billion. Taking 1954's $4 billion of highway building as a base, the task forces at that time found it feasible to step up annually from $4 billion to $6 billion to $8 billion to $10 billion and level off at $11 billion in the fourth year of the expanded undertaking.

This year, the approach was somewhat different. Starting from the estimated $5.7-billion highway expenditure forecast for 1956, the task forces set out to determine the feasible stepping-up period and the maximum annual increments both in total expenditure and in net construction volume up to and including the first peak year.

In instructions to the task forces, ARBA reiterated its objective: Removal of all highway deficiencies in a period of ten years. On the question of voting the money to do the job, however, the association gladly yielded to the legislators.

No estimate could be made by the task forces of the roadbuilding money that might be forthcoming, and none was attempted. Actually, for the new approach used in estimating roadbuilding capacity of the highway industry, no forecasts of available money are needed. The task forces set out to determine only the present and future ability of highway builders to perform construction if given maximum opportunity.

It isn't mentioned in the ARBA report, but total spending for highway construction in 1957 should go up to $7 billion or more from this year's estimated $5.7 billion. There is a backlog now of close to $2 billion of federal and state funds for federal-aid projects, programed and unprogramed. And, if the Senate approves the Fallon Bill, an additional two-year allocation of $3.5 billion in federal money, calling for about $1 billion of state matching funds, will become available to the states July 1.

Much of this big increment would go for engineering and right-of-way acquisition. Total volume of expenditures for new highways in the nation, however, could rise to more than $8.5 billion in 1958 and $9.5 billion in 1959. The portion of these potential outlays paid out for construction on highway projects would increase more gradually—from perhaps $5.5 billion next year to possibly $7 billion in 1958 and $8 billion in 1959.

• **Raising engineer efficiency**—Expanded engineering productivity, as projected in Table A, could take care of annual highway programs larger than those in sight for the three years ahead. By 1959, engineering capacity to handle a $10-billion program would seem adequate for any rate of highway expenditure likely to develop by then.

Use of time-saving methods can speed planning and design operations and greatly increase output with little or no addition to the engineering force, the task force found. With only about 600 civil engineering graduates entering the highway field each year, highway departments have turned to procedures that can double the productivity of the 32,000 highway engineers now employed (ENR Mar. 15, p. 25). These improvements include

A. Highway Construction Levels That Can Be Supported by Industry Capacity (Billions of Dollars)

Year	Engineering	Materials and Supplies	Contractors' Construction Capacity	Machinery and Equipment
1956	6.5	7.0	8.8	7.3
1957	8.0	8.3	10.8	8.5
1958	9.0	10.0	11.4	9.7
1959	10.0	11.0	11.9	11.0

B. Material Requirements, Highway Construction (1)

	1955 $4.6 Billion Program Level (1000's)	Units	For Each $1.0 Billion Increase in the Program Level (1000's)
Cement	58,700	Bbls	16,000
Aggregates	403,100	Tons	76,415
Bituminous Materials	5,853	Tons	995
Lumber	385	MBM	87
Timber Piling	12,575	L.F.	2,823
Steel	1,938	Tons	510
Structural	983	Tons	278
Wide Flange Shapes	444	Tons	125
Standard Shapes	211	Tons	59
Bearing Piles	96	Tons	27
Sheet Piles	39	Tons	12
Plates	193	Tons	55
Reinforcing	807	Tons	212
Pavement (2)	118	Tons	31
Bar	689	Tons	181
Corrugated Metal Pipe	148	Tons	20
Reinforced Concrete Culvert Pipe	2,640	Tons	512
Cement for R.C. Pipe	2,900	Bbls	564
Wire Fabric Reinf. for R.C. P.	60	Tons	12
Clay Pipe and Tile	8,100	L.F.	2,039
Petroleum Products	651,840	Gal.	122,794
Explosives	90,190	Lbs.	18,345
Structural Steel Fabrication Capacity	847	Tons	240
Signs	380	Each	83

(1) These requirements do not include the materials used on highway maintenance.
(2) Mostly wire fabric but includes some bear mat.

C. Contractors Estimate of the Productive Capacity That Could Be Achieved in One, in Three and in Five Years (Billions of Dollars)

Period	Earth-moving	Surfacing	Structures	Other	Total Highway Construction Contracts
Present	2.0	2.5	2.0	0.8	7.3
In 1 year	2.6	3.1	2.4	1.1	9.2
In 3 years	3.6	4.1	3.3	1.4	12.4
In 5 years	4.5	5.4	4.2	1.8	15.9

greater use of aerial surveys and photogrammetry, standard plans, electronic computers and photographical reproduction.

Long-range highway programs that permit planning and right-of-way acquisition well in advance of construction are a big help to best use of engineering talent. At the end of 1955, the task force reported, there was a backlog of highway work for which plans were partially or wholly completed amounting to about $19 billion. But, the task force said, existing bottlenecks in determining urban and rural locations of interstate routes and in selecting urban federal-aid systems can seriously impede engineering output in the next few years. Many states need laws to permit land acquisition for future use, the report emphasized.

• **Steel will meet demand**—Despite unlooked-for steel shortages that showed up last year and are continuing through the first half of this year, the task force on materials and supplies reports ample shape-rolling, plate-rolling and structural fabricating capacity for any possible increase in the highway program.

Current dislocations, the task force says, are the result not of insufficient rolling or fabricating capacity but of unbalanced distribution of basic ingot production among the finishing mills of the steel industry. Mills rolling structural shapes turned out 300,000 tons less than the year before, because basic ingot production was diverted to other industrial demands.

But with additional needed expansion now on the way for wide-flange shapes, the task force feels that the rolling mills will be able to take care of the heaviest highway program contemplated, on top of all other construction demands.

Similar conclusions are reported for only a small part of plate production but this tonnage is important to many projects. The plate rolling mills are capable of producing 7,900,000 tons a year, as they did in 1951, and this capacity would take care of any possible expansions.

Structural fabricating shops have an estimated capacity, on a one-shift basis, of 3,600,000 tons, the task force says. Double shifting could probably increase this by 50% to 5,400,000 tons. It was lack of structural steel that held last year's shipments to about 3,000,000 tons and caused the long-delayed deliveries that are still in effect for fabricated steel.

All other materials required for highway construction, as listed in Table B, should be in ample supply to support any roadbuilding program now anticipated, the task force feels.

• **Contractors well set**—Of all the roadbuilding resources studied, the construction contractors showed the greatest latent capacity to increase production. The task force on construction analyzed complete questionnaires returned by more than 3,000 highway contractors who obviously were sincerely interested in helping to find out what their branch of the industry could do. This large cross-section of the highway contractors in business proved also to be a representative sample of all the firms in the field. A

D. Contractors Estimates of Expanded Productive Capacity That Can Be Achieved in Varying Periods (Billions of Dollars)

Period	Total Highway Program Level	Volume of Highway Construction Contracts	Equipment Requirements
In 1 year	$11.5	$9.4	$3.1
In 3 years	16.9	13.1	4.3
In 5 years	19.8	15.4	5.1

E. Additional Equipment Required for $1.0 Billion of Net Highway Contract Construction

(For annual work volumes in excess of $5.8 billion)

Construction Machinery and Allied Equipment	No. Units
Tractors, crawler (1)	4,500
Tractors, 2 and 4 wheel (contractors type)	3,000
Scrapers, hauling (all types)	3,200
Off-Highway Hauling Equipment (end, side and bottom dumps)	1,800
Power Cranes & Shovels	3,000
Motor Graders	2,500
Rollers, all types	2,500
Loaders, front end, wheel	1,600
Ditchers & Trenchers	250
Hydraulic Hoists & Dump Bodies (2)	(16,000)
Air Compressors, portable	2,250
Batching Plants, concrete	300
Concrete Mixers, portable	1,200
Contractors Pumps	2,340
Concrete Pavers	150
Concrete Spreaders	175
Concrete Finishers	175
Truck Mixers & Agitators	1,500
Asphalt Plants, portable	200
Bituminous Pavers (spreaders-finishers)	300
Bituminous Distributors, truck mounted	250
Crushing & Screening Plants, portable	250
Miscellaneous Units (10%)	3,144
Subtotal	34,584
Motor Vehicles	
Pickups & Autos	2,600
Trucks, 1 1/2-3 tons	9,600
Trucks, over 3 tons	8,500
Trucks, miscellaneous	1,800
Subtotal	22,500
Grand Total	**57,084**

(1) Including attachments and power control units.
(2) Not in total, included as integral parts of trucks and off-highway hauling equipment.

F. Highway Contractors Employee Requirements For Designated Program Levels (Billions of Dollars)

	Highway Program Levels	Net Highway Construction Contracts	Employee Requirements (Number)
After 1 year	$10.8	$8.8	520,000
After 3 years	11.9	9.1	610,000
After 5 years	12.3	9.4	630,000

breakdown by business volume of the firms replying closely paralleled the distribution of highway contractors awarded work, as reported by ENR.

Replies showed that contractors worked at 49% of their estimated capacity during 1955, when contract construction accounted for $3.6 billion of the $4.6 billion spent on highways. The contractors' answers indicate that with present organizations and equipment, which includes average amounts rented, $7.3 billion of highway construction contracts could be completed in 1956. Adding $400 million in force account construction and $1.1 billion in right-of-way and engineering expenditures, the task force comes up with a total highway program of about $8.8 billion that could be carried out this year if existing contractor capacity were utilized in full.

Full utilization is not possible, however, in building a rounded highway program. If it were, the totals shown in the last column of Table C would be attainable on the sole basis of contractor capacity, expanding through the years. But the needs of a comprehensive roadbuilding program do not call for the services of earthmovers, paving contractors, bridge builders and other construction firms in the precise proportions shown in the other columns of Table C.

Contractor capacity figures from Table C therefore have to be adjusted to a realistic pattern before they can be applied to a balanced highway construction program. This adjusted contractor capacity, actually usable in such a program, forms the basis for the figures in the contractors' column of Table A. These figures, of course, also include appropriate allowances for right-of-way, engineering, and force account construction.

• Labor no problem—Ample labor is available to inaugurate a peak highway program right now, the task force found. In 1955, contractors required 67,000 employes for each $1 billion of highway work performed. The number needed has been declining steadily from 128,000 per $1 billion in 1948. With increased mechanization and more efficient operations, the manpower requirements will be even less in the future.

At the end of 1955, there were 580,000 men available for highway construction, including 240,000 employed by highway contractors. Applying the ratio of 67,000 workers per $1 billion and assuming the working force could be adequately equipped with construction machines, this manpower pool could carry out some $8.8 billion of construction contracts in a year, for a highway program totaling $10.4 billion.

These figures appear in Table F, listing manpower requirements for various program levels. Normal population growth and increase in the manpower pool for highway workers would step up the program level to $12.3 in five years, without any improvement in productivity of equipment or labor.

• Equipment a key—Actually, however, contractors and equipment manufacturers will continue their headlong drive for greater productivity. In Table D, contractors who responded to the questionnaire indicate how much they think productivity could be increased, under favorable working conditions, with the use of construction equipment in the amounts noted.

Contractors replies also showed that those doing the largest volume of work got the greatest productivity out of their equipment by far. Contractors doing more than $5 million per year, for example, put $4.50 of work in place for each dollar's worth of equipment used. Among contractors handling less than $250,000 of work a year, the ratio dropped to 90 cents worth of work placed for each dollar of equipment.

Highway contractors at the beginning of this year had more than 330,000 major units of equipment at their disposal. This inventory, estimated to have a replacement value at current prices of about $3 billion, represents a net gain of 27,000 major units over the list compiled a year earlier. In addition to equipment owned by the contractors themselves, the tally also includes smaller numbers of units belonging to equipment distributors and materials producers serving the highway field.

In the judgment of the task force, this array of equipment is capable of supporting contract construction with a volume of $5.8 billion per year in building the expanded highway program proposed. With force account work, right-of-way and engineering included, this means a program level of $7.3 billion, as shown in the last column of Table A.

To increase the net contract construction volume by $1 billion a year, the task force estimates that the current inventory would have to be augmented by the additional equipment listed in Table E. This list is not a mere extrapolation of the current inventory; it reflects equipment improvements and the trend toward greater use of tractor-shovels and wheel-type tractor-scraper combinations. The 57,000 units would cost about $500 million at present prices.

With allowance for the demands of other types of construction, the task force estimates that equipment manufacturers, operating at capacity, could supply additional units sufficient to boost net contract construction volume by $1 billion a year, for a gross increase of $1.2 billion per year in the highway program level. This equipment output, of course, includes provision for normal replacement of units that will be wearing out. And it includes new plant capacity, resulting from $200 million of expansion to be completed this summer by manufacturers, that would supply most of the items that were threatened by possible shortages when last year's survey was made: wheel tractors, concrete paving equipment, bituminous paving equipment, and crushing and screening plants.

Boston Area Will Get Port Authority

Spurred by a state financial condition which many have characterized as "desperate" the Massachusetts legislature last week ended years of debate and approved measures setting up a Massachusetts Port Authority.

The new authority will take over operation of a number of facilities in the Boston area—including Logan Airport, the Sumner Tunnel and the Mystic River Bridge—and the transit sheds, piers and other facilities of the Port of Boston Commission. It is estimated that bonds totaling about $103.6 million will have to be issued to finance the authority, and pay outstanding debts on the facilities it takes over.

Spur for passage of the legislation was a state debt that now totals nearly $1 billion—advocates pointing out that an initial $6.4 million in appropriations could be saved in the first year of authority operation. More than two months of sharply drawn debates preceded the legislative actions—during which civic organizations and labor groups, among others pointed to the state debt as a principal reason for the authority.

In addition to taking over and operating the existing facilities, the seven-man authority also would be charged with an immediate study of a second vehicular tunnel under Boston Harbor, to parallel the existing two-lane Sumner Tunnel, which is now the city's only link to Logan Airport.

In acquiring the properties mentioned, the authority would pay the state about $18.2 million to cover outstanding bonds on the airport; pay the City of Boston about $9.5 million for outstanding Sumner Tunnel bonds; and about $27 million to retire Mystic Bridge bonds.

'Pike Work Halted

Arrests and damage suits follow investigation of mine-fill job on tollroad

Last week a long-smouldering controversy over a unique feature of the construction of the Northeast extension of the Pennsylvania Turnpike suddenly exploded into cancellation of three major contracts, arrests on charges of conspiracy to defraud and a countersuit for damages by a contracting-engineering firm.

At issue were the method and cost of a plan to fill in old mine workings under parts of the right-of-way for the new turnpike extension (ENR March 15, p. 40) in the coal mining areas of Luzerne and Lackawanna Counties.

The Manu-Mine Research and Development Co. of Reading and the Rogers Construction Co. of Scranton held contracts with the Pennsylvania Turnpike Commission for work to stabilize sections of the 12-mi undermined area. Silt to be flushed—through bore-holes—into the old mine working to build up a solid base under the road. A third contractor also held a similar contract, but was not involved in the actions last week.

After Scranton newspapers had hinted at irregularities in the conduct of the work, it was disclosed on March 14 that the Turnpike Commission had ordered the work halted, and had called in the State Department of Mines and the Department of Justice to investigate performance on the two contracts.

Result of that investigation last week was:

- Cancellation of contracts totaling $2,278,351 held by the Rogers Co.; and cancellation of a unit-price contract held by Manu-Mine.
- Advertisement for new bids on the flushing contract.
- Arrest of five individuals—two of them officials of the Rogers company and one an inspector for Manu-Mine—on charge of "conspiracy to cheat and defraud the commission."
- A damage suit filed in Harrisburg against the Turnpike Commission, in which Manu-Mine seeks a reported $943,852.

Deputy State Attorney General Victor Wright said at Harrisburg that the Rogers firm had received about $500,000 in payments on its contracts at the time of the cancellation; and that Manu-Mine had collected about $7.5 million on its contract, which included drilling at $12.50 per ft and supervision of other contractors' flushing activities.

He added that the state was basing its cancellation of the contracts on the charge that the fill for which it was paying hasn't all been going into the abandoned mines.

Tollroad Dilemma in Ohio

Ohio highway officials this week were considering a neat problem, posed by consulting engineers surveying costs and possible revenues on the state's long-discussed north-south turnpike.

The problem: Build the 300-mi road as a complete tollroad for the full distance, at a cost of $385.8, or build it as a "broken" road, with a 40-mi free section between Springfield and Delaware towns which are west and north of Columbus, at a cost of $346 million. But revenues in the first year from the complete tollroad are estimated at $21.3 million, for the "broken" road at $17.5 million.

The cost estimates were turned in by J. E. Greiner Co., the revenue figures by Coverdale & Colpitts.

Spiral Museum

Work begins after 12-year delay on Wright's design

Site work got underway in New York City this week, after a 12-year delay, for the Solomon R. Guggenheim Museum, designed by Frank Lloyd Wright. The general contract for the building, which will be the famous architect's first work to go up in New York, was awarded last Thursday to the Euclid Contracting Corp., New York.

The contract amount was not disclosed, but various estimates have placed the cost between $2.5 million and $3 million.

Unexplained delays held up construction of the museum for several years after Wright completed the plans in 1944. Further postponement resulted from a lively disagreement in 1953 between Wright and the New York City Department of Housing and Buildings. A favorable ruling by the Board of Standards and Appeals of New York last year (ENR Dec. 29, 1955, p. 24) finally cleared the way.

Designed to house modern paintings and sculpture, the circular museum will rise from a rectangular base, widening as it ascends. Inside, a ¼-mile spiral ramp on a 3% grade will wind several times around the hollow core of the building. Artwork will be exhibited easel-fashion on the inside of the sloped boundary walls. There will be no horizontal floors. The outside diameter of the ramp will average 80 ft.

New Power Era

Two utilities get permits to build first full-scale nuclear power facilities

The Atomic Energy Commission last week issued the first permits for the construction of private large-scale nuclear power plants. The permit went to Consolidated Edison Co., New York City, and Commonwealth Edison Co., Chicago.

Each construction permit allocates special nuclear material to be made available over a 40-year period for use as reactor fuel. The amounts calculated for the 40-year period are: for Consolidated, 5,699 kg of U-235; for Commonwealth, 8,323 kg of U-235.

Consolidated Edison plans a $55-million power plant, exclusive of cost of land and transmission facilities, using nuclear and conventional fuels in combination to generate 236,000 kw. The plant will be built on a 350-acre site lying along the Hudson River near the Village of Buchanan in Upper Westchester County, about 24 mi north of New York City. The construction permit calls for completion of the reactor by Oct. 1, 1960.

The Commonwealth Edison plant is estimated to cost $45 million, exclusive of the cost of land and transmission facilities. The plant, with a net generating capacity of 180,000 kw will be built on a 950-acre site at the junction of the Kankakee and Des Plaines Rivers in Grundy County, Ill. about 50 mi southwest of Chicago. A completion date of Sept. 30, 1960, is stipulated in the construction permit. The need for government disaster insurance to back up what the companies can get from private insurance companies may hold up some of this construction. But Con Edison promises to go ahead, even if Congress doesn't vote federal insurance.

Steel Shipments Top Record

Structural steel fabricators shipped a record 306,760 tons of structural steel from their shops during March. This was 35% more than a year ago, according to AISC, and is encouraging news to the construction industry which lists structural steel at the top of critically short materials.

First quarter 1956 shipments of fabricated structurals hit 667,002 tons, 26% above last year and a postwar high. However, the fantastic pace of new bookings will keep fabricators hustling. March bookings rose to 365,517 tons, bringing the first quarter total 45% above 1955 to more than 1.1 million tons.

Los Angeles sewage treatment ruling sets . . .

New Polution Control Formula

The California State Water Pollution Control Board established new discharge requirements for the proposed revisions of Los Angeles' Hyperion sewage treatment plant (ENR, Apr. 5, p. 29) in a precedent setting decision May 2.

The order results from an action by Manhattan Beach, a city on Santa Monica Bay, which appealed a set of discharge requirements established last October by the Los Angeles regional water pollution control board. The city contended that no solids should be dumped into the bay, and that there should be no visible evidence of sewage discharge.

The state board's decision upholds the right of Los Angeles to discharge properly treated sewage and sludge into the waters of Santa Monica Bay. And the order establishes new concepts in California pollution control. These are:

Setting of specific numerical values rather than general terms.

• Dividing the receiving water into several areas for specific beneficial uses rather than applying the same set of standards to the entire area.

• Requiring the City of Los Angeles to establish a monitoring system that will measure compliance with the requirements at regular and frequent intervals.

Manhattan Beach officials are angry at what amounts to almost complete rejection of their appeal. They—together with nearby Hermosa Beach—had already filed a $30 million damage suit against Los Angeles and had asked a court injunction to halt planned revisions to the Hyperion plant. The plaintiffs contend that the planned revisions would worsen the situation rather than remedy it. And they ask for $10,000 a day continuing damages for each city from the time the judgment is rendered until the nuisance is abated.

Rear Adm. Cushing Phillips, president of the Los Angeles Board of Public Works, said that his board's first reaction to the state board decision is that the requests are not unreasonable and that is a step forward to make the requirements definite. Preliminary examination indicates that no major changes will have to be made in Hyperion plans. Phillips concluded, "as far as we can tell we can and will comply."

The decision bears directly on the California concept of water pollution control. This concept calls for evaluation of beneficial uses of receiving waters of the state, and control of discharges to protect as many of the benefits as possible. It does not permit the state to tell dischargers how to achieve the quality desired, but only what requirements the discharge should meet. This pollution control set-up has been subject of criticism—by fishing interests and cities along the beach—who contend that the waters should be maintained at the standard of the highest quality beneficial use. The pollution control concept has just weathered a severe political storm in that the legislature did not include it as a function of the newly established California Water Department, but kept it as a separate agency.

The new order establishes three areas in Santa Monica Bay. Area 1 is water within 5,000 ft of the Hyperion outfall and digested sludge line outlets. This area is to be maintained for waste dispersion and dilution as well as for shipping and pleasure boating. Area 3 encompasses the waters nearest the beaches (including those within 1500 ft of the high water line). This section is to be maintained in the highest quality since it will be used for swimming and other recreation.

All the rest of Santa Monica Bay is Area 2, in which the quality must be kept high but not quite as high as Area 3.

The quality requirements are expressed in terms of daily, weekly, monthly and semi-annual tests resulting from the complex monitoring system that the City of Los Angeles must establish and maintain. Samples of surf and seawater are to be taken at regular intervals at regular places. Samples of the ocean bottom are to be taken to make sure there is no sludge bank build up outside of Area 1. And samples of digested sludge and effluent are taken just as they enter the discharge lines.

All areas must be free from floating or suspended solids recognizable by eye as coming from the sewage discharge. Area 1 near the outlet must have 6.0 of dissolved oxygen at all times. And grease concentration in Area 1 shall not exceed 2.0 ppm in any three consecutive samples or in more than 20% of any twenty consecutive samples.

Major control for the beach area is the old standard California bathing water requirement. This states that coliform concentration shall not exceed 10 per ml in 20% of the samples. A new twist is that this standard cannot be exceeded in three consecutive samples. And the beach area has a requirement regarding grease accumulation.

The off-shore area not near the outfalls (Area 2) also has a coliform standard but it is 100 per ml maximum rather than 10 per ml. The thinking is that although there will be swimmers in these waters as result of water skiing, etc., the concentration and exposure will not be as great as in the surf and beach area. Area 2 also has a transparency criterion to meet. This is measured by the Secchi Disk (described in "Limnological methods" by Paul S. Welch, Blakiston Publishing Company, 1948). Transparency must equal or exceed 20 ft in 50% of all readings and must exceed 15 ft in 80% of any twenty consecutive readings. Area 2 also has a bottom sample organic-matter control.

Record Start for AWWA

This week's 75th anniversary meeting of the American Waterworks Association in St. Louis is on its way to a new attendance record. As of Monday, over 2,200 persons had registered, well ahead of the pace at last year's record Chicago meeting where 2,567 persons registered.

Factors behind the probable new record are the nation's increasing concern with water, the central St. Louis location, and yeoman efforts of St. Louis area water people. Number of exhibits is also at a record high—booths of 100 companies overflow the exhibit area in huge Kiel auditorium.

Hurricane-Clogged Streams Threaten N. C. With Malaria

Governor Luther H. Hodges of North Carolina has told a Congressional committee in Washington that unless his state gets federal aid to drain hurricane-clogged streams it may face "malaria fever of epidemic proportions."

He was testifying before a Senate committee considering Civil Defense fund. The House approved the money in March as an amendment to the independent offices appropriations bill.

Hodges said the state must have $5.4 million to drain creeks, rivers, and sounds filled with debris deposited by four hurricanes within the past two years, and that a health hazard is developing from mosquitoes breeding in huge areas of stagnant waters.

He said the four hurricanes in the last two years flooded about 2,650 mi of 22 coastal counties, and that the state is doing all it can to meet the needs but finds federal aid is urgently needed also.

Pollution Bill

Federal aid provision is cut and 1948 law changed in House-approved version

The House Public Works Subcommittee on Rivers and Harbors last week cleared its federal water polution control bill.

The approved version contains two key improvements over the 1948 law that expires this year but cuts in half —to $500 million over a ten-year period — the originally proposed amount of federal aid for treatment works construction.

However, the future of the aid provision is still highly uncertain since the bill faces action by the full Public Works Committee, the House and a House-Senate conference committee.

Both recommended changes in the 1948 law have the endorsement of state and federal regulatory officials and both were contained in the Senate pollution control measure passed last year.

- The proposed bills would expand and strengthen the research, planning and training activities of the U. S. Public Health Service in the stream pollution control field. In the bills, USPHS gets a clear-cut mandate to mesh into a comprehensive program the many now uncoordinated programs administered by the various states and interstate agencies. The federal agency gets $2 million a year to distribute as federal grants to meet part of the costs of planning and administering state control programs.
- Second, the bills—while recognizing the primary responsibility of the states in this field—for the first time give the federal government effective powers to force a clean up. There are safeguards—firmer in the House than in the Senate bill—to make sure that federal enforcement will be invoked only after efforts by state and interstate agencies fail. The House measure contains a requirement that federal courts weigh the "practicability" and "physical and economic feasibility" of abatement measures by industry sought by USPHS before ordering companies to carry them out. This provision in the present law, was knocked out of the proposed Senate bill but accepted by the House subcommittee after strong urging by industry.

Party lines broke as subcommittee chairman John A. Blatnik (D., Minn.) forced through the construction grants feature. The best that opponents could do last week was to cut the size of this program. By an 8-to-4 vote, the subcommittee okayed the 10-year grants program sought by Blatnik, but scaled down the amount of aid from $1 billion to $500 million over the period. The subcommittee voted to hold the federal contribution to each project to one-third of its cost or $300,000, whichever is smaller, and put a $50 million a year limit on total aid.

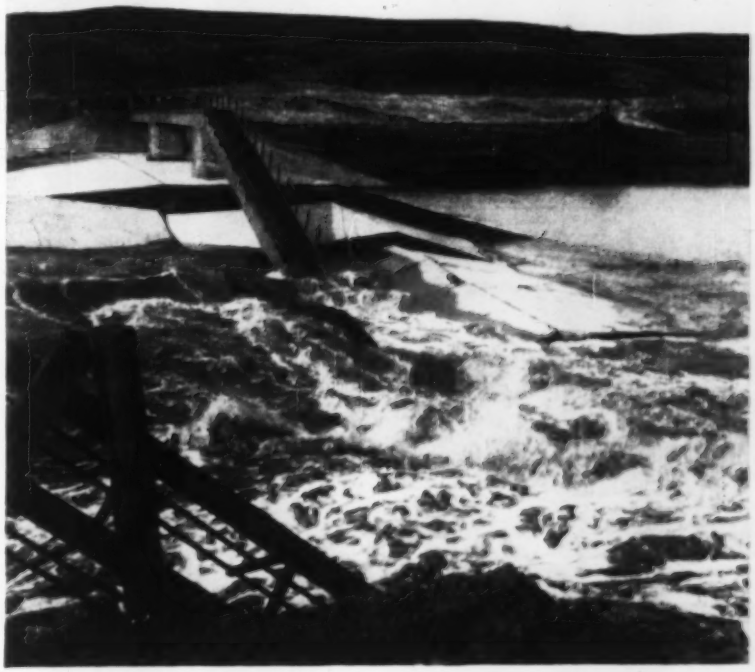
The Senate bill provides no federal construction money, while Blatnik had sought matching 50-50 grants totaling $100 million a year with a $500,000 limit per project—all for municipal sewage treatment plants.

The fight over federal construction aid is far from over. Rep. George A. Dondero (R., Mich.) says he'll try again to kill the grants section when the full committee votes on the bill in the next few weeks. "I doubt very much it will stay in the bill," he says. Dondero, ranking Republican on the Public Works Committee, declared, "I don't think the Administration will accept the bill in its present form."

State officials range from lukewarm to outright opposition on the construction grants provision.

But Blatnik, already a surprise winner of the first round, feels chances of getting the full committee's endorsement are picking up fast. He points to a heavy amount of favorable mail.

Blatnik has distributed to other congressmen a mimeographed list of the mayors and other municipal officials—from New York City and 170 other cities and towns in 42 states—that have endorsed the grants feature.



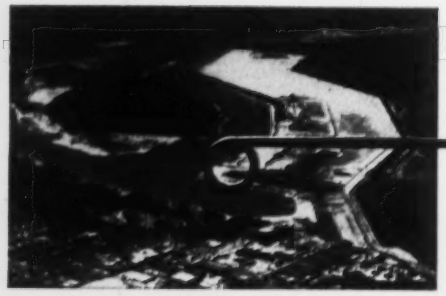
Concrete-Faced Spillway Washes Out

Heavy spring runoff waters breached a 38-ft concrete-faced overflow spillway on the Battle River near Forestburg, Alberta, washing away 3,000 cu yd of reinforced concrete and much greater quantities of earthfill. Estimated damage: $350,000.

The break occurred at 10 a.m. on April 22 eighteen hours after a labor foreman discovered a small hole in the downstream face.

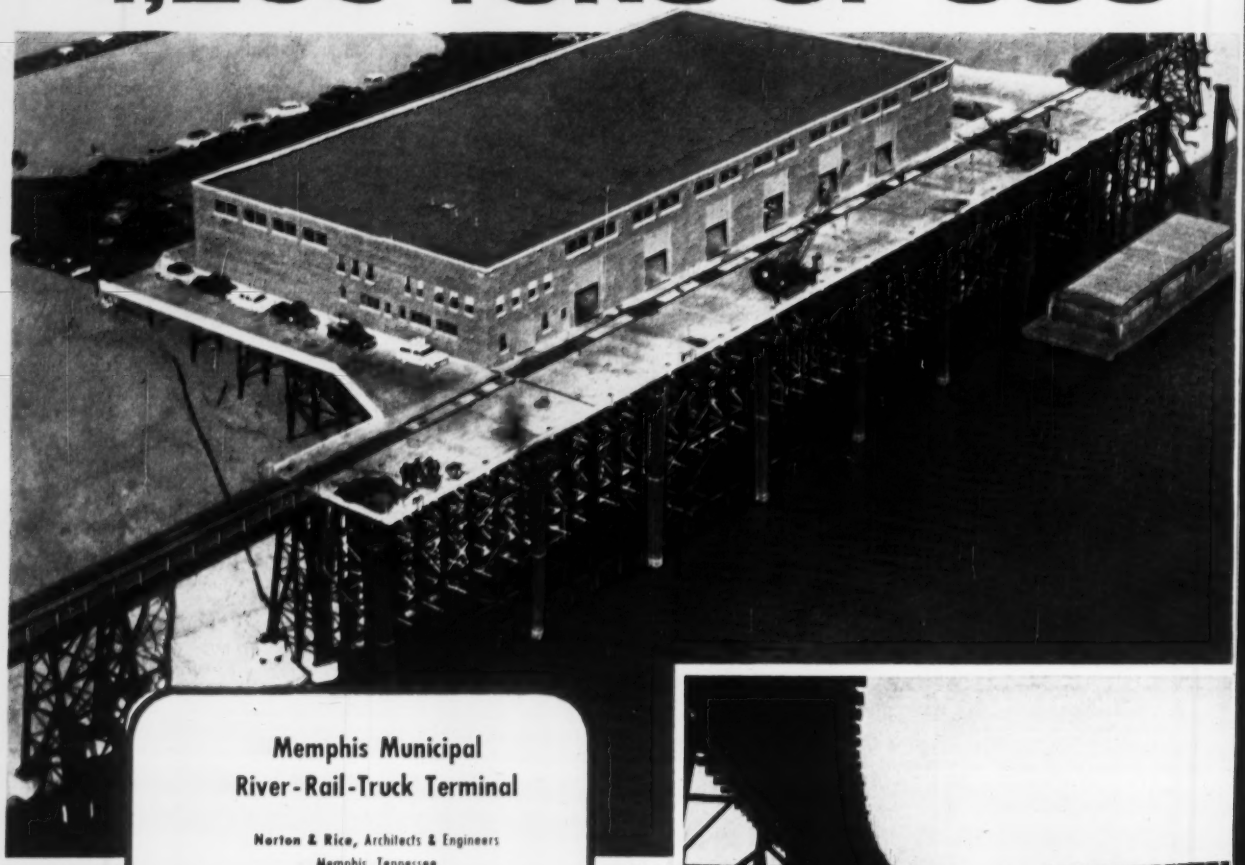
Apparently, increasing amounts of water flowed through the original hole washing away progressively greater amounts of earthfill until the concrete facing collapsed. What caused the original hole has not been determined, but investigators believe a break occurred in a bypass pipe through the dam. The possibility that allowable stresses were exceeded has been discounted since the spillway was designed for 15,000 cfs and estimated flow at failure was 3,800 cfs.

The spillway is part of an earthfill dam which was built to impound cooling water for a nearby thermal power plant under construction by Canadian Utilities Ltd. Company officials hope to have the damaged spillway repaired by mid-August to meet the previously scheduled September starting date for power generation.



New Three-Way securely and

1,200 TONS OF USS

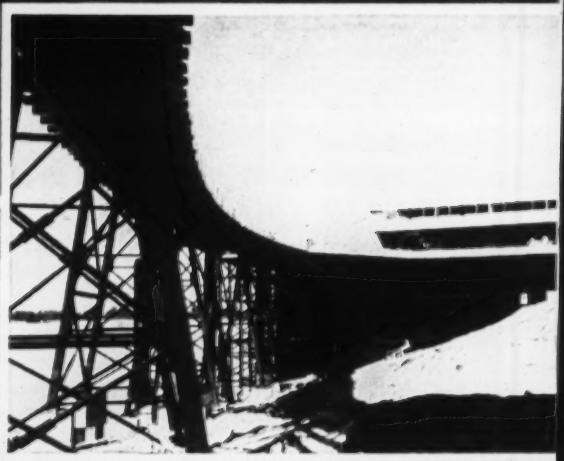


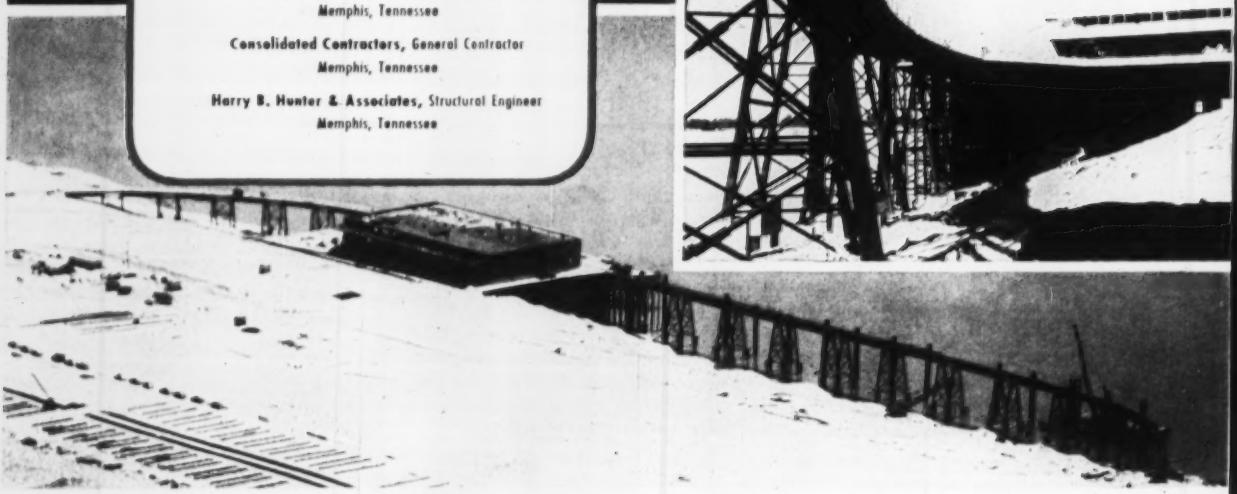
Memphis Municipal
River-Rail-Truck Terminal

Norton & Rice, Architects & Engineers
Memphis, Tennessee

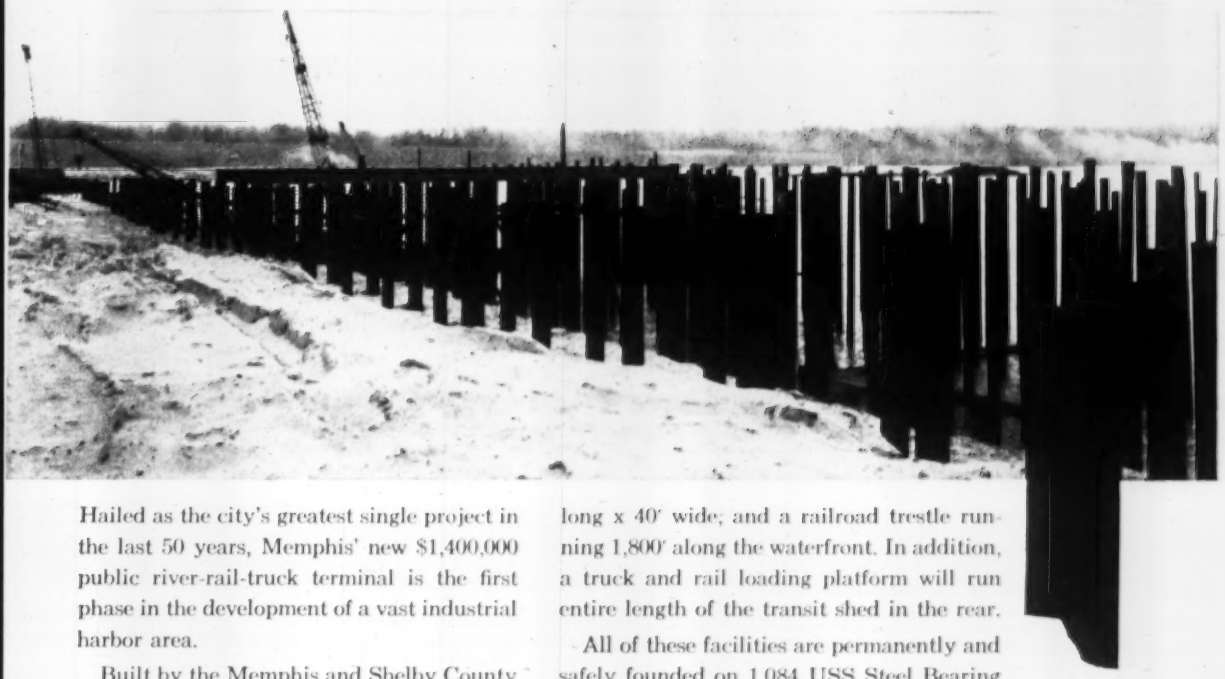
Consolidated Contractors, General Contractor
Memphis, Tennessee

Harry B. Hunter & Associates, Structural Engineer
Memphis, Tennessee





Terminal at Memphis permanently built on *Steel* BEARING PILES



Hailed as the city's greatest single project in the last 50 years, Memphis' new $1,400,000 public river-rail-truck terminal is the first phase in the development of a vast industrial harbor area.

Built by the Memphis and Shelby County Port Commission, this modern terminal consists of a large transit shed containing 28,800 square feet of floor space, a paved dock, 400′ long x 40′ wide, and a railroad trestle running 1,800′ along the waterfront. In addition, a truck and rail loading platform will run entire length of the transit shed in the rear.

All of these facilities are permanently and safely founded on 1,084 USS Steel Bearing Piles varying in height from 35′ to 75′, some of which were driven to a depth of 38′.

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USS STEEL BEARING PILES have been proved structurally and economically sound in a wide variety of projects. On large jobs and small. In fresh water and in salt water. Under buildings, bridges, piers, docks, dams and viaducts. They can support unusually heavy loads per pile . . . and resist high bending stresses. They effectively resist lateral displacements . . . penetrate with remarkable ease through all types of unstable sub-soil materials, to provide a secure means of supporting foundations at great depth.

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USS Steel H-Bearing Piles

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UNITED STATES STEEL

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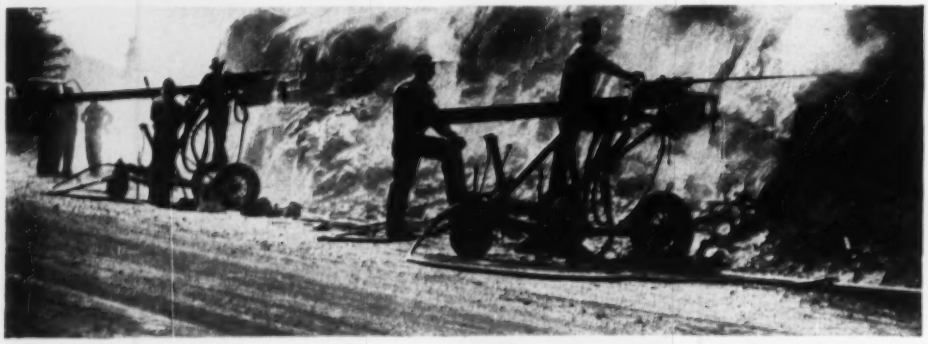

Gardner-Denver wagon drills—they're hard hitting, mobile, easily positioned for accurate hole-spotting. Readily handle angle holes, toe holes, line drilling.

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Arkansas Highway

First phase of $28-million project has been completed

The first phase of a new $28,000,000 Little Rock-North Little Rock, Ark., superhighway has now been completed and plans covering route location, design characteristics, interchanges, Arkansas River bridge, railroad crossings, cost estimates, etc. are being studied by the State Highway Commission. According to Brown and Blauvelt, New York consulting engineers to the commission, completion of the expressway and bridge, including final design and construction, will take about four years at normal construction pace.

Extending south from the northern suburbs of North Little Rock, the 5-mi highway proceeds in an almost straight line through North Little Rock, across the Arkansas River, and through Little Rock to its southern suburbs. Designed for 60-mph speeds, the expressway will free city streets of through traffic from five federal and state routes.

The expressway will consist of six express lanes separated by a 24-ft-wide median and flanked on both sides by 32-ft-wide service roads.

Grade separation structures will carry a number of through streets across the expressway to permit free movement of city traffic and to provide adequate access to the expressway itself. The structures will generally be concrete decks on standard rolled beam stringers of composite design.

The main structure of the Arkansas River bridge will be approximately 1,570 ft long with viaduct approaches bringing the total to 3,040 ft. Main river spans will consist of two continuous girders with transverse floor beams and longitudinal stringers supporting the decks. They will be supported on concrete piers resting directly on rock. Approach spans on both ends will be of a rolled beam composite construction. They will be carried on steel bents.

Seven interchanges will be provided, two at expressway terminals and five within the cities proper. Three of these, those at the ends and the one at the Little Rock end of the bridge, require circular movements of some of the access ramps. The others consist of ramps in a diamond pattern between the expressway and service roads.

Property Condemnation Laws For Pipelines Termed Faulty

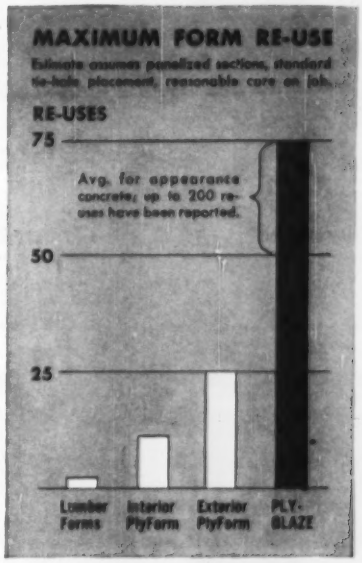
Construction of a natural gas pipeline in Washington state may be halted by a hearing to be held April 25 before the Washington state supreme court at Olympia.

A test case brought by Mr. and Mrs. W. C. Thomas, owners of a 24-acre tract near Issaquah, challenges the authority of the Pacific Northwest Pipeline Corp. to condemn a half-acre right-of-way through their land. It was filed and will be argued on behalf of the Thomases and 14 neighbors by Attorney Payne Karr, who also is attorney for the Oil Heat Institute in the state.

Karr maintains that condemnation laws laid down for railroads and pipelines are faulty. If the court upholds his contention, new legislation would be required to justify pipeline condemnation suits. Judge Malcolm Douglas of King County Superior Court found for the company but the decision has been appealed.

A $180-million pipeline from New Mexico has reached into the state and is scheduled to begin carrying natural gas late this year. Gas companies in the state are spending many millions of dollars in preparing to convert from manufactured gas and in expansion of their distribution systems.

BRIDGE across Arkansas River is the major structure over the highway's length.



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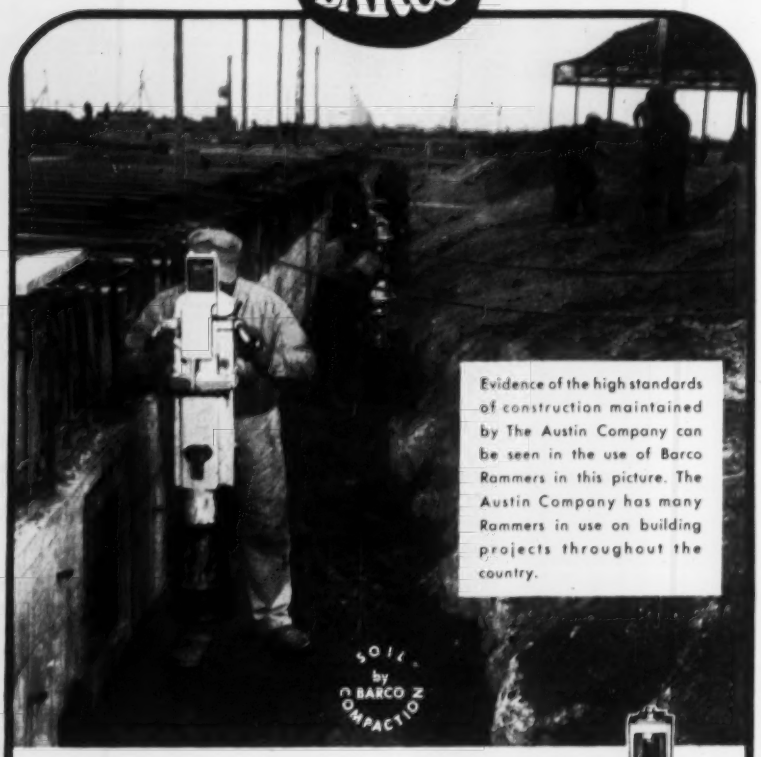

Evidence of the high standards of construction maintained by The Austin Company can be seen in the use of Barco Rammers in this picture. The Austin Company has many Rammers in use on building projects throughout the country.

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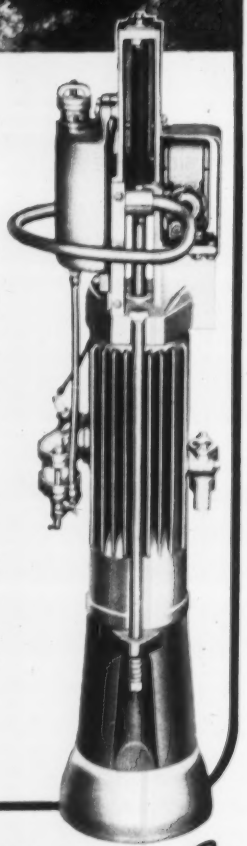
Ask for a Demonstration—We will be glad to arrange a demonstration for you; see our nearest distributor or write. SEND FOR A COPY OF CATALOG 621.



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Cleveland Subway

Engineers say new loop is economically feasible

Construction of an extensive new downtown subway loop in Cleveland has been recommended by consulting engineers as being economically feasible.

The proposed loop, to be financed and built by Cuyahoga County, would tie in with Cleveland Transit System lines (ENR April 28, 1955, p. 30). Voters already have approved a $35-million revenue bond issue for construction of the project.

The feasibility report—submitted to Cuyahoga County commissioners by Praeger-Cutting-DeLeuw—completes the first phase of the engineers' four-part contract. If the commissioners approve the recommendations, they will give the consultants the go-ahead signal to prepare preliminary plans and estimates.

Before the second phase can be completed by the consultants there are a number of administrative and operating decisions to be made. County Engineer Albert S. Porter already has raised questions on some of the items that need policy clarification before he can make final recommendations as to feasibility of building the subway.

For one thing, arrangements will have to be made with the CTS on transferring riders to the subway, rerouting or discontinuing certain suburban bus lines, and setting the amount of rental fee to be paid to the county for use of its subway.

Another important question to be answered concerns the type of construction. Opinion of local police, fire, service and traffic departments—as well as building owners and tenants to be affected by the subway—will have to be considered. And a final decision on this point, expecially as to whether the project should be completely decked over or left open in certain areas, will have an affect on construction costs.

Another major point to be considered is whether the utilities will give financial assistance to moving and replacement. If this load is added to county responsibilities it also will boost construction costs.

There is a reported $6-million cushion for costs. A 10% contingency was included with each cost item as well as a separate contingency of $2.8 million. These two factors, plus the difference between their total estimated cost and the total bond issue, provided what is expected to be a sufficient amount to cover any construction extras.

❶ *Pre-cut tiles are laid in place...*

❷ *securely anchored by a grout mixture...*

❸ *roofing, gravel applied; deck nears completion*

350,000 sq. ft. warehouse roof deck erected in only 30 days

A GIANT new warehouse in Miami for Burdine's department store chain, was naturally suited to a multi-value Tectum roof deck.

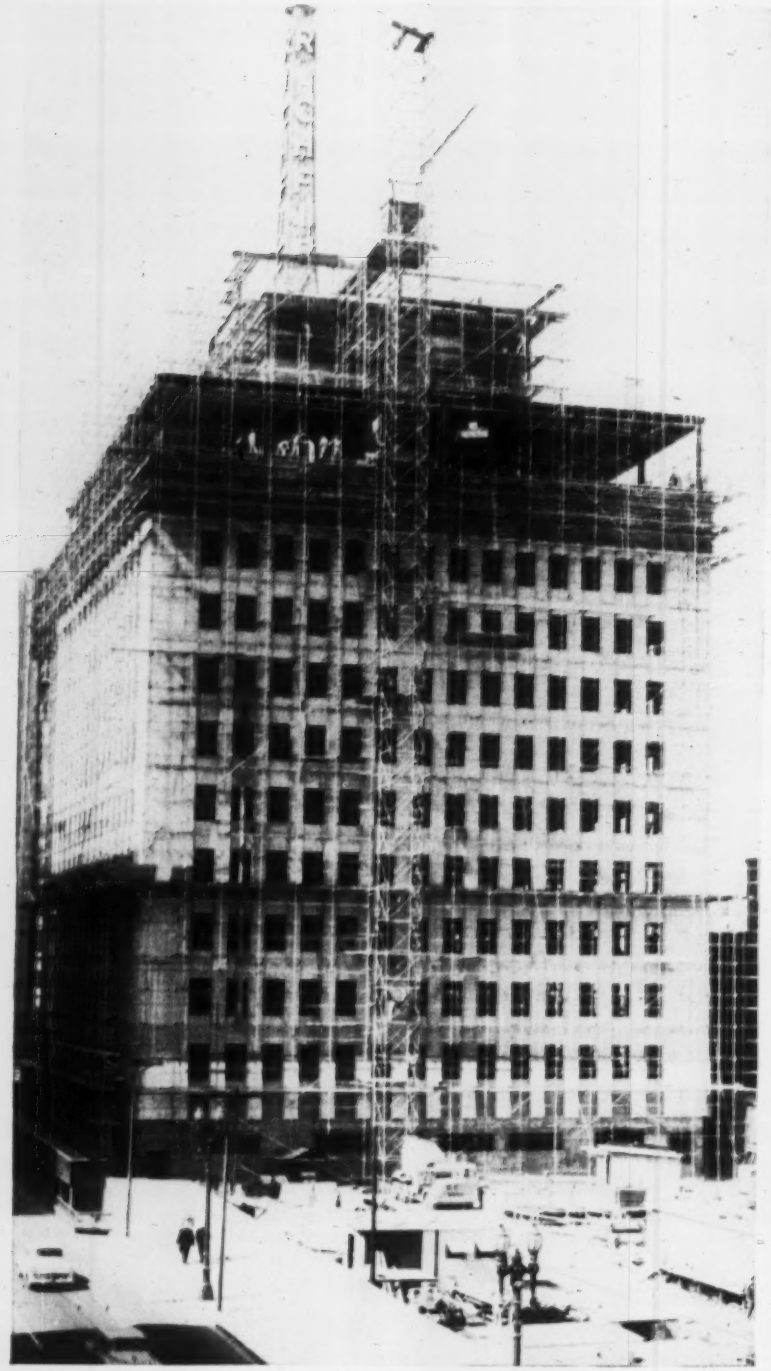
Erection of the 350,000 square foot deck required only 30 working days—an average of nearly 12,000 sq. ft. per day. Tectum adapted itself to mechanized installation since the tile were precut at the factory. Unusually light in weight considering its structural capacities, Tectum is easily handled by a single workman. The deck requires no curing period, may receive the built-up roofing immediately. Simple grout anchorage provides uplift resistance surpassing even the requirements of hurricane-prone Florida.

When completed, the Tectum roof deck insulates, controlling warehouse temperatures in all seasons. And noncombustible Tectum protects stored materials from the disastrous effects of fire. In many other ways—and for all building types—a Tectum roof deck serves and saves during construction and for the life of the building. Contact your nearby Tectum distributor, or write Tectum Division, Peoples Research and Manufacturing Co., 514 South 6th St., Newark, Ohio.

Weed • Russell • Johnson Associates, Architects,
Frank Rooney, Inc., General Contractor,
Tectum installation by Bohnert Sheet Metal & Roofing Co.,
all of Miami.

FOR PLANTS • COMMERCIAL BUILDINGS • INSTITUTIONS • HOMES

Exterior walls are put to work in a tall office building that may be subject to big lateral forces, thus reducing the cost of the welded steel frame

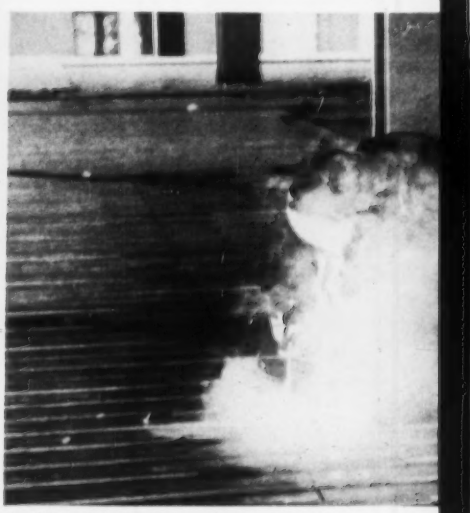


CONCRETE WALLS designed to take seismic forces enclose the 12-story Superior Oil Co. building in Los Angeles.

GIRDER CONNECTION (under inspection by Roy Johnston, left, and George Brandow, consulting structural engineers)

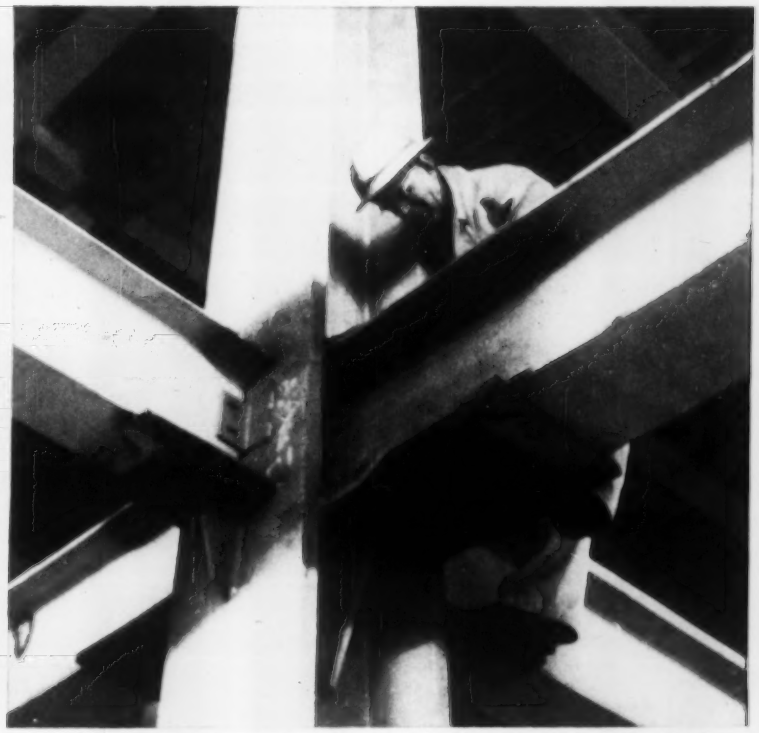
Walls Help

Walls, floors and structural steel frame of the 12-story Superior Oil Co. Building in Los Angeles team up to carry all the loads on the structure to the ground. The 1,600-ton welded



PLUG WELDING attached cellular steel decking to the structural frame. The

was designed for full continuity. Top plate was field welded in sequence indicated to prevent cracked welds.



CHECKING WELDS, inspector L. R. Zimmerman, Osborne Laboratories, looked over every connection. Seat plates for girders were shop welded to the columns. Clips allowed members to be bolted together until welding was completed.

teel Frame in Multistory Building

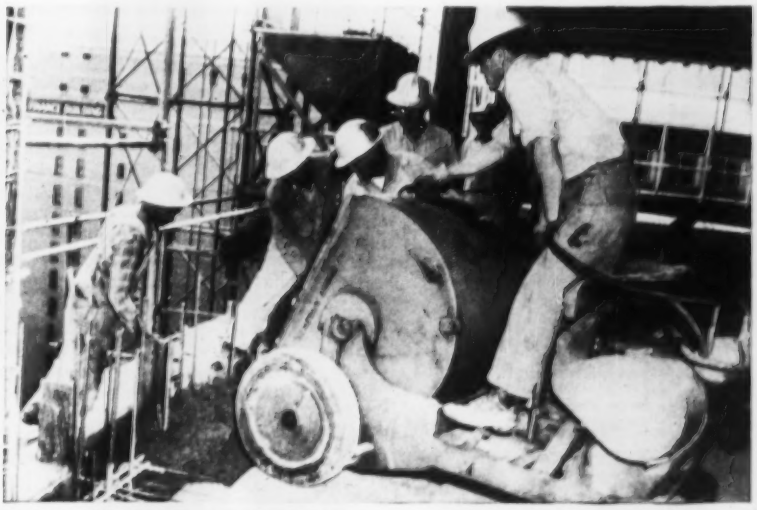
frame is designed to take vertical loads, whereas the exterior walls are designed as shear elements to resist wind and seismic forces.

The $5.5-million, 200-ft-high office building is square in plan, 115 ft on a side. Column spacing, governed by requirements for a basement garage, is 28 ft. Story height is 12 ft 7 in.

Girders framing into the columns are welded to them for full continuity. They support beams spaced about 5 ft c-c, which in turn carry a cellular steel deck topped with reinforced concrete.

Reinforcing in the floors and ex-

floors are counted on to transmit lateral forces to the exterior walls.



WALL CONCRETE was placed after floors were concreted. Steel dowels 2 ft long tie the walls to the floor fill.

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No pre-mixing with cement

Not a paint . . . ART-ROC troweled into the cement surface holds attractive colors safe from attack by cleansers, alkalis or rust. Provides a tough extra-hard surface at no extra cost . . . both for interior and exterior installations. Floors or pavements with ART-ROC are bright and attractive . . . easy to clean, economical to keep up.

Colors . . . Hardens . . . Beautifies . . . Dustproofs!

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Remember . . . ART-ROC is not just a surface film, but color that's built-in to stay . . . and it's so easy to use!

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NAME_____
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SPRAY APPLIED lightweight plaster to the underside of the floor system.

WHITE MARBLE FACING was set in vertical strips on the building exterior.

terior walls is designed to make them a complete structural diaphragm.

• **Rigid-frame walls**—The concrete outer walls are 6 in. thick. Cast in place, they consist of 6-ft-high spandrels and integral 3-ft-wide piers, leaving openings in each story for windows 4 ft wide by 6 ft high. Spandrels and piers are reinforced to take the shear.

The spandrels are faced with light-gage stainless steel, while each pier is covered with a continuous, vertical, white marble facing 1¼ in. thick. The inside of these walls is lined with metal. The windows are fixed, since the building is air conditioned.

Steel columns were brought to the site in two-story lengths. Clips were attached to the ends for bolting successive tiers together until splices were welded. Also, seat plates for the girders were shop welded to the columns. Top plates were shipped loose.

• **Welding method avoids cracks**—The top and bottom plates are 1¾ in. thick. Because of this thickness, a definite welding sequence had to be followed to avoid cracked welds. The top plate was welded first to the column web, then to one column flange. These welds were allowed to cool while the girder connection on the opposite side of the column was welded. After that, the top plate was welded to the second column flange and finally to the girder. Sometimes, it was necessary to preheat prior to welding.

Welders used both E6010 and E6012 welding rods. The former is a deeply penetrating type, used for the first passes, while the latter was used to finish the welds.

Columns and beams along the outside of the building are fire protected by encasement in the concrete walls. In the interior, the steel members above the first floor are protected with 1-in. vermiculite plaster. In addition, the underside of the steel deck was sprayed with this plaster. A ceiling, generally of mineral acoustic tile, was hung under the air-conditioning ducts.

Claude Beelman & Associates are the architects. Brandow & Johnston are the structural engineers. The William Simpson Construction Co. is the general contractor, with Jack Ogden as superintendent.

This fine new building will always stay young . . . thanks to complete electrical availability provided by **Robertson Q-Floor**

The Mid-America Home Office
PRUDENTIAL INSURANCE CO.
Chicago, Illinois
Naess & Murphy, Architects & Engineers
Geo. A. Fuller Co., General Contractor

The new Mid-America Home Office of The Prudential Insurance Co. of America was designed with an eye toward the future. To meet the ever-increasing wiring requirements of modern electronic office equipment, architects Naess and Murphy prepared the structure to handle the highest electrical load of any office building ever built. To do this job easily and to permit power and telephone outlet changes and additions at minimum cost, Robertson Q-Floor construction was used.

By the use of this weight-saving, cellular steel structural floor, every exposed 6" square area of the floor has become the potential location of a convenience outlet. Electrical engineering service on Q-Floor wiring is available through any of the General Electric Company's construction materials offices.

Robertson Q-Floor construction also saves construction time and money. Its weight-saving factor means lower cost of foundation and structural steel. It immediately becomes a safe storage and working platform for the benefit of all trades. And because no combustible forms and falsework are required for the concrete fill, there has never been a construction fire on a Q-Floor job. Add these features together and it's easy to see why so many fine new buildings are built with Robertson Q-Floor. Write for literature.

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Another

"The performance of this machine speaks for itself," says Sidney Steel, paving superintendent of the Austin Paving Co. "Our records tell us this machine has long since paid for itself and it still has years of work left in it."

RECORD OF PERFORMANCE

Austin Paving Company of Dallas, Texas put down 5,580 sq. yards of concrete in one day with single Flex-Plane Finisher!

Speed, power and flexibility, designed into the Flex-Plane, enabled it to easily keep pace with a dual drum paver while making two passes over the roadway, without benefit of a spreader.

WORLD'S LARGEST BUILDER OF CONCRETE FINISHING EQUIPMENT

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Paving Record for...

Flex-plane

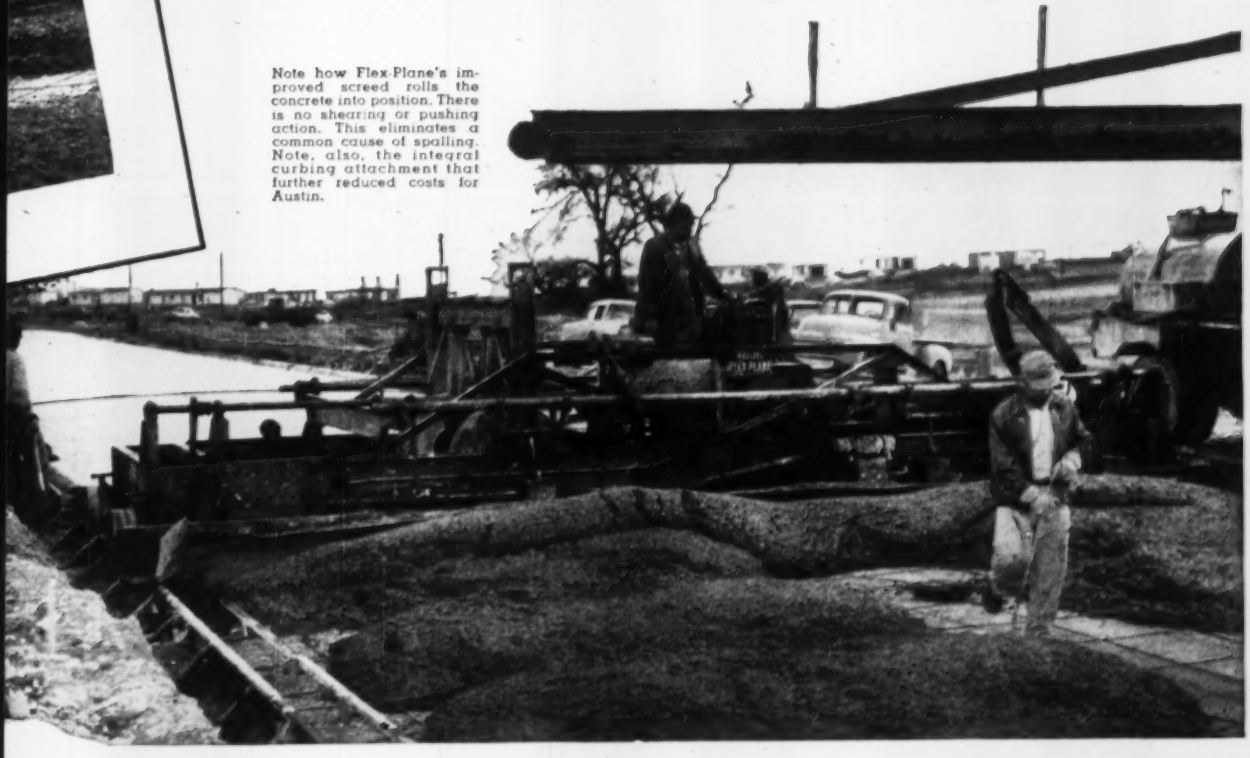
● A Flex-Plane Portable Finishing Machine recently spread and finished 1860 lineal feet of 27-foot width street, with 6" integral curbs on both sides, in a single day for the Austin Paving Company of Dallas, Texas.

"Taking the concrete as it came from a single dual-drum paver, the Flex-Plane machine spread and finished it to a degree that required a minimum of hand finishing. It's a great piece of equipment!" says Sidney Steel, Paving Superintendent for Austin.

The Austin machine was equipped with integral curb attachments on both sides, and according to Steel, this feature alone saved them many pouring hours.

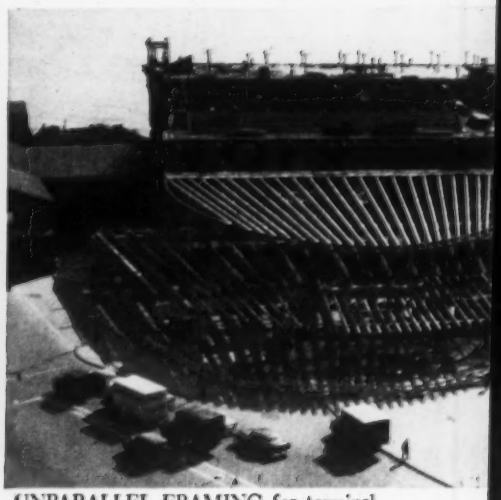
It's this kind of performance that has made the Flex-Plane, the industry's fastest selling and most desired finishing machine. Why not let our sales-engineers put you in touch with a Flex-Plane user in your area. His story will convince you that, if you do any roadway or runway paving at all, you can't afford to be without a Flex-Plane.

THE FLEXIBLE ROAD JOINT MACHINE COMPANY
7300 THOMAS ROAD • WARREN, OHIO



Note how Flex-Plane's improved screed rolls the concrete into position. There is no shearing or pushing action. This eliminates a common cause of spalling. Note, also, the integral curbing attachment that further reduced costs for Austin.

ASYMMETRIC COLUMN PLACEMENT on main support frames and . . .

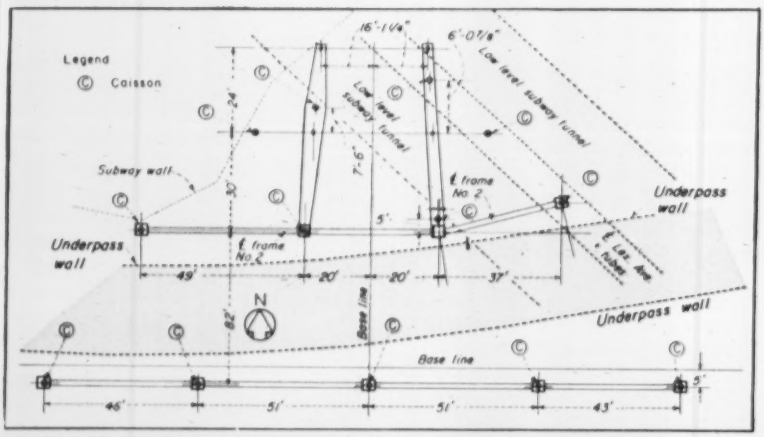


UNPARALLEL FRAMING for terminal

Staten Island Ferry Terminal

Old Port a Challenge To Terminal Builders

Buried obstructions, hanging frame, force design tricks in rehabilitation and extension of ferryboat facility



UNDERGROUND STRUCTURES (subway tubes, parkway and utilities) force random column placement and unusual single- and double-cantilever girder design.

Digging through more than three centuries of civilization can be as interesting for construction men as for archeologists. But results are apt to dampen the fun when physical works of past generations foster dozens of design and construction headaches.

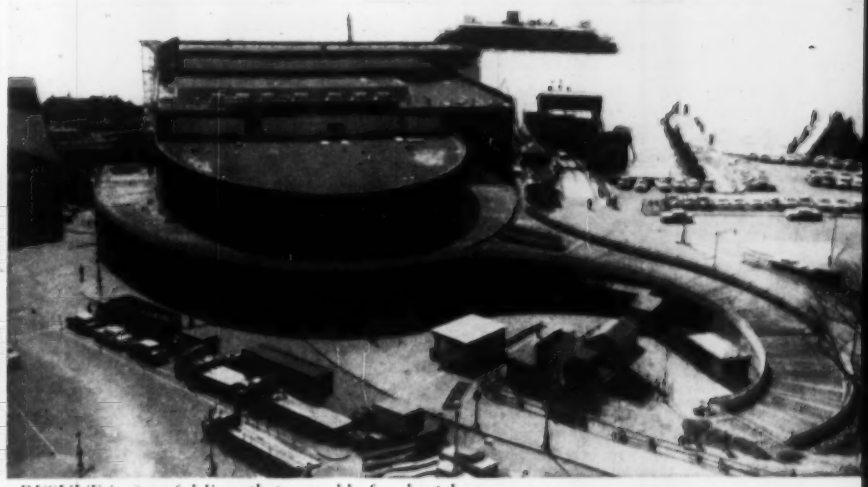
Designers and foundation contractors started their portions of a $4-million rehabilitation and alteration operation on New York City's Whitehall-South Ferry Terminal Buildings at the southern tip of Manhattan with a keen interest in the historical significance of their undertaking. Most of them, though, by the time the job was finished, gave profound thanks that Henry Hudson bypassed Manhattan Island in 1609 and sailed on up the river, leaving construction of first wharves and roads to Dutch settlers 15 years later. Hudson's act saved 15 years of construction progress to be wrestled with in laying down foundations in 1955.

The job, as it confronted designers Roberts & Schaefer, consulting engineers of New York city, was to plan rehabilitation, alteration and addition to existing ferryboat terminal facilities at the foot of Whitehall and South Streets near the city's historic Battery Park.

The terminal facility, main commuter link between Staten Island (Richmond County) and New York City's business center, handles as many as 250 pedestrians per minute during peak periods, and serves more than 1,500,000 vehicles per year. This activity, crowded into 11,400 sq ft of area on two levels, has had the buildings bursting at the seams for many years.

The two buildings, constructed almost 50 years ago, were connected 25 years later by a temporary-type bridge structure of steel and corrugated

main floor and roof . . .



RESULT in graceful lines that resemble ferryboat bows.

metal. Existing buildings were structurally sound generally, but in various states of disrepair, so the problem evolved into three major parts, including addition of more than 16,000 sq ft of terminal area.

First, in importance and cost, was construction of an extension building at the northern end of the Whitehall Street Building, with alteration of exterior facing and interior finish of the existing structure. Heating, ramp and stairway de-icing and new utilities were also part of this work. Second, the connecting structure had to be rehabilitated with new exterior facing and interior treatment. And finally, the job of refurbishing the South Street building was to be undertaken, with alterations of the second floor to provide office and drafting room space for the city's Department of Marine and Aviation. One obstacle was to accomplish all work without interfering with ferryboat service or flow of traffic (foot or vehicular).

• **No space for footings**—It was during preliminary planning that hardships bequeathed by earlier builders first were felt, according to Lewis H. Rabbage, the department's chief engineer. A detailed survey of the construction site revealed that foundations for the Whitehall extension would need special design treatment to crowd them in around the maze of underground obstructions.

Passing directly under both existing structures and proposed addition is a twin 23-ft dia tube of a subway tunnel at a low level (—30 ft). Crossing at an intermediate level and at an angle, which brings it under the addition only, is a 98-ft-wide sub-grade street designated as the Battery Park Underpass. In addition to these major interfering structures, there are numerous tunnels for subway station facilities and many utility pipes and conduits.

The trick for Roberts & Schaefer was to spot column foundations where they would provide necessary straight-line girder support, yet penetrate the maze to bearing in solid rock.

As they were finally planned and subsequently installed, foundation columns comprised 14 driven steel caissons, 24- and 30-in. dia, bearing loads ranging from 320 to 1,300 kips. Socket lengths were from 2 ft to 3½ ft in depth, and steel core varied from none to 110 lb per ft. Controlled concrete for caissons was specified at 4,000 psi as opposed to general specification of 3,000 psi minimum.

Foundation contractors, Euclid Contracting Corp., of New York City, drew the most ticklish operation of the entire project. Five of the caissons went down dangerously close to the subway tubes—three within 5 ft of both—and rested in sockets at an elevation of about —30 ft, approximately the elevation of the inverts of the twin tubes. Men had to be stationed at critical points within the tubes during driving operations.

This company also bore the brunt of stratified leavings of fore running builders. Caissons ran through all manner of debris:

Two layers cobblestone pavement
One layer of concrete pavement
One layer of blacktop pavement
10-ft solid brick vault wall
Old boiler (Drill rig pulled up short, indicating rock, then slipped right through)
4-ft ties and rails (trolley car)

Besides these, drillers encountered miscellaneous rubble and pipe lines that were unlocated on maps or any existing records. The practice was to proceed cautiously with the operation, break out the obstacle, and if no burst of water or gas showed that the section was "alive", ignore it and go on.

The extension, designed as a bridge structure over South St., was originally planned with parallel reinforced concrete frames—one adjacent to the existing building and the other on the northern side of the street. The difficulty in placing the column foundations, however, led to development of a system of unsymmetrical framing members on seemingly haphazard column supports. Only the main four-bay frame, adjacent to the South Street Building, could be built with columns in straight alignment, and on that one, only the two central bays are the same length. In the more complex (southerly) framing system there are nine columns with no pier-to-pier distances equal. There is a 14-deg horizontal break in the 3-bay frame, and the two unparallel longitudinal beams are a single and a double cantilever of entirely different cross section.

Concrete frames are made up of a series of rectangular force systems, formed by the columns, beams and sub-grade tie members. Because of the large masses of concrete, columns are hinged at pile caps just above the bottom ties.

Because floor elevations of the new portion of the structure were pre-designated by the finish floor elevations of the existing building, and a minimum clearance of 12 ft 6 in. above street level had to be maintained, depths of the beams were rigidly restricted. As a result, amounts of steel that went into the frames far exceeded normal quantities for specified loading.

One interesting phase of the design

was the use of ramp and arcade parapets as a working part of the concrete structural design.

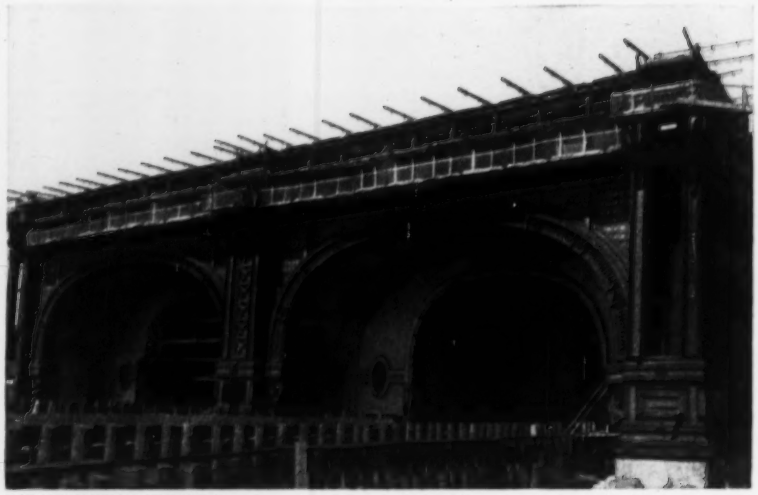
In plan view, the extension is a half oval that resembles the curving bows of the boats it serves. Because of the unsymmetrical substructure and the oval shape, no beams except the main transverse steel roof beams are parallel. It was necessary, therefore, to set up the framing pattern for the joists based upon a grid system, with two base lines establishing coordinate points, and every joist spotted according to given coordinates.

Because of the unusual method of erection, all steel except that for the transverse beams was shipped from the mill raw, and all fabrication was accomplished in the field. All connections were welded, with drilling limited to anchor bolts and service pass-throughs. Even on ramps, dimensional control was maintained by the coordinate system. Practically every beam is provided with composite beam-slab action through use of spirals welded to the upper flange.

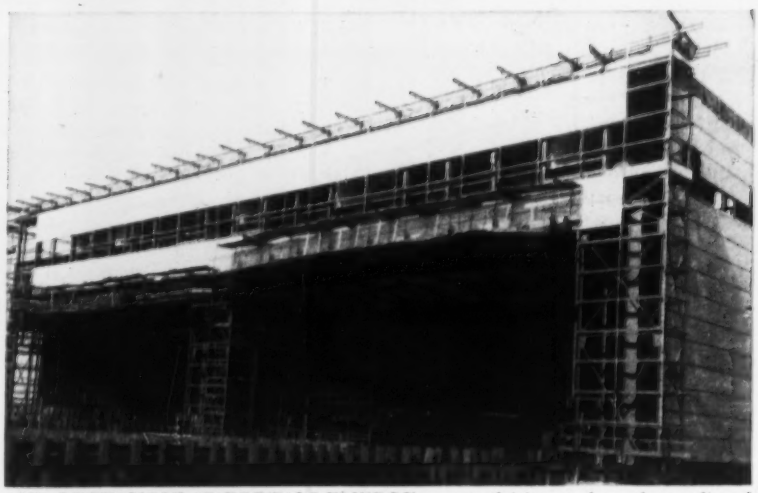
• Weight dictates heating design—Two completely separate heating systems are being installed in the revamped and new buildings. Because weight of tubing, cover material and heating medium would result in excessive loading on framing members of the existing facilities, radiant heat for the buildings will be furnished by a hot-air system. De-icing of ramps, stairways and walls, however, will be accomplished with conventional wrought-iron panels and liquid medium. Since ramps are elevated, insulating vermiculite concrete beds were cast under the panel coils.

Waiting-room areas, where the hot air radiant system will be installed, will be served by a hot-air plenum with blower-supplied ducts taken off at intervals. Resultant savings in weight obviated necessity for extensive reinforcement of existing framing.

To withstand impacts of landing operations, the original building was framed with the first floor system suspended from principle members of the second floor. Since increased loading on any area would also have required additional bolstering, a prime consideration for extensive interior and exterior alteration was to use the lightest material possible. All existing stucco and ornamental cast iron was removed, and interior as well as exterior resurfacing was done with lightweight porcelain-on-steel panels. Porcelain-on-steel was used on the curved outer faces of the extension building as well, with all transoms and convertible panels so designed that they could be replaced for fenestration according to the final layout of concession areas surrounding the waiting room floor.



GINGERBREAD GOES, as cast iron ornaments and stucco are removed.



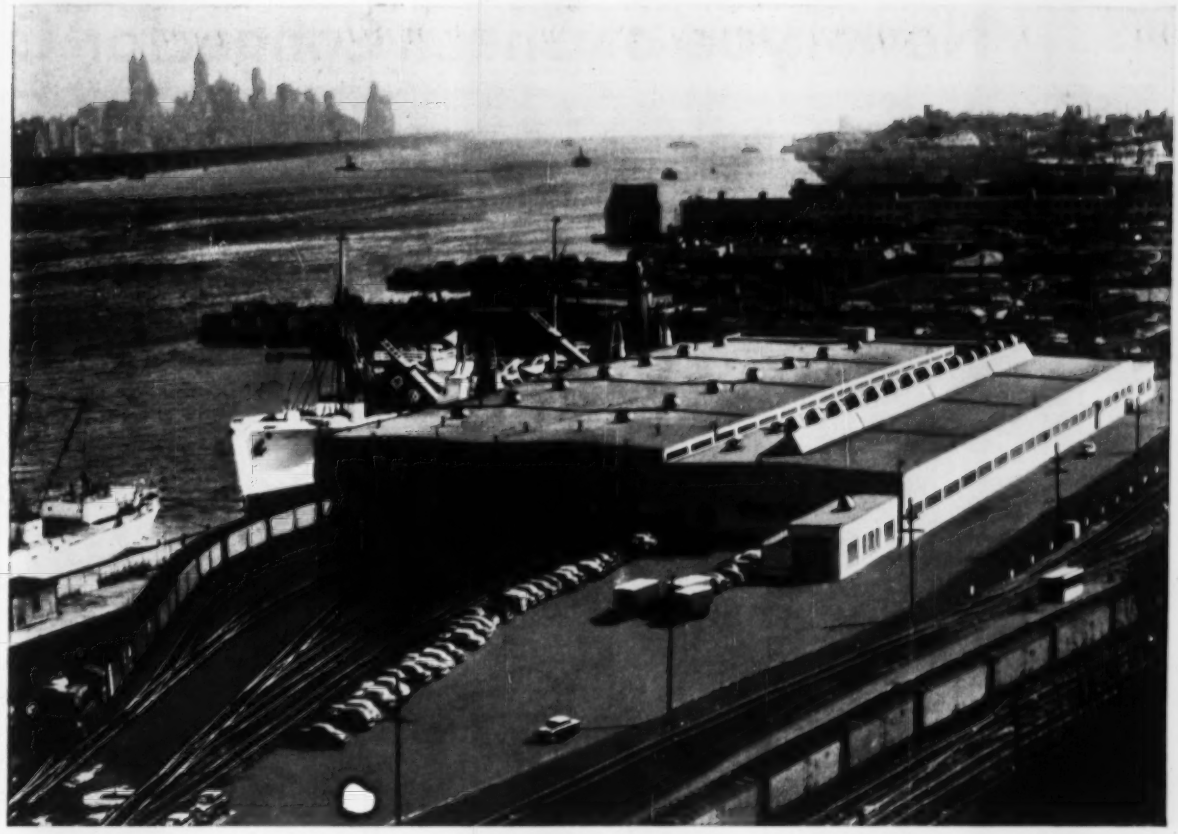
AND RECTANGULAR PORTALS EMERGE, as porcelain-on-steel panels are clipped to light framework for modernization.

Mansards were removed from the Whitehall Street Building, and a flat roof was built. Ornamental plaster and cast-iron arches of the ferry portals were removed, leaving rectangular portals to be paneled according to the modernized lines of the building. The new flat roof of the connecting building, and re-facing with porcelain panels will give for the first time the continuity of finish necessary to make the unsightly appendage an integral part of the building group.

The South Street building will, at present, retain its stucco and gingerbread, but the building will be completely rehabilitated for service of the city department, pending a complete overhauling sometime in the future.

• Business as usual—The South Street Building at the start of operations was in use only sporadically by the Immigration Department, so it was a comparatively simple matter to direct ferry traffic to this structure during part of the reconstruction program. By using South St. and Slip #3, located in the connecting building, it was possible to keep two slips in continuous operation, retaining one for standby emergency use. In order to maintain the use of Slip #3, it was necessary only to clear the adjacent concourse. By thus maintaining normal schedules of traffic, the thousands of commuters traveling between the city and Staten Island were practically unaffected by the activities of the contractors in the area.

Holding general contracts on the project were Gramercy Construction Corp., Frank E. Freeman, Inc. and Mandel Bros. Contracting Corp., all of New York City. Foundation and incidental work were done by Euclid Contracting Corp., and structural steel contracts were held by Klevens Corp. Both are New York City firms. E. A. Verpillot, deputy chief engineer, is supervising for the Department of Marine and Aviation. D. P. Denitto represents Roberts and Schaefer.



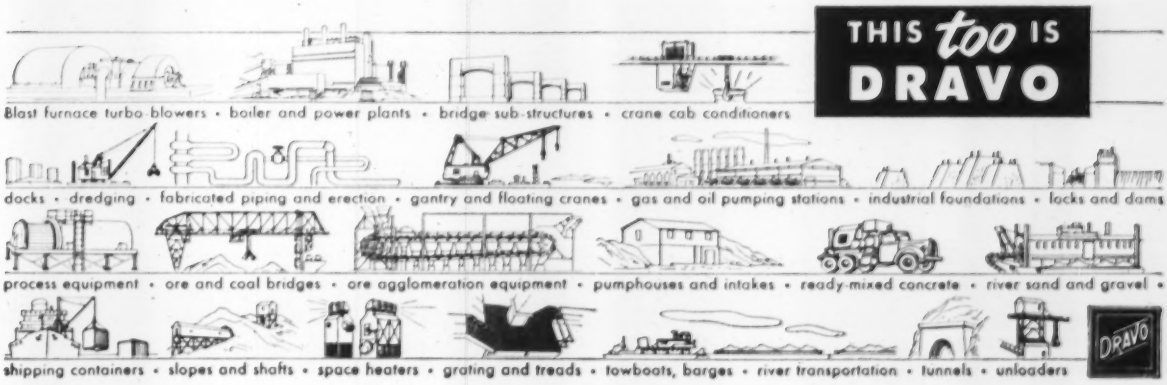
DRAVO HEATERS GIVE BANANAS A WARM WELCOME

United Fruit's fight against cold weather extends further than Chiquita Banana's advice to "Never Put Bananas in the Refrigerator." In the year-'round operation of a banana terminal, temperatures *must* be kept *above* 54° F. during all loading and grading work—or fruit injury may occur.

In United Fruit's new banana terminal—the world's largest—at Weehawken, New Jersey, 23 Dravo *Counterflo* Space Heaters insure optimum temperature for maintaining bananas in the best possible condition. They also maintain comfortable working temperatures. This flexible system reduces danger of a terminal-wide heating failure.

The complete Dravo Heater installation costs 30% less than a central steam heating system. The *Counterflo* Heaters are ceiling-mounted to save valuable floor space. They eliminate the expense of standby heat during idle periods.

Today, more than 10,000 Dravo Heaters, large and small, have been installed to heat and ventilate all types of industrial and commercial buildings. This is another example of how Dravo has been serving business and industry in a variety of engineering fields for over 60 years. Dravo considers customer satisfaction essential in all its products and services. DRAVO CORPORATION, PITTSBURGH 25, PENNA.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shipping containers • slopes and shafts • space heaters • grating and treads • towboats, barges • river transportation • tunnels • unloaders
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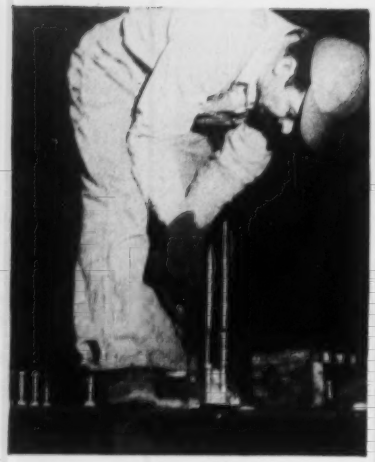
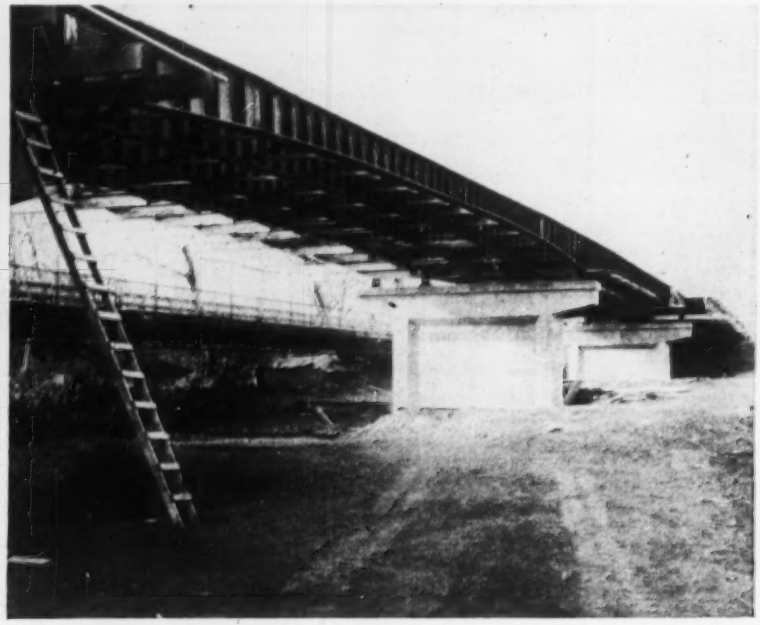
New Type of Shear Connector Cuts





In a bridge:

- Permits good compaction of concrete decking
- Aids spacing of reinforcing

A bridge completed at Fort Pierre, S. D., is the first with a new type of shear connection in composite construction. Its concrete deck is tied to steel girders by dowels speedily attached to the top flange of the girders with a welding gun.

These steel dowels, or studs, are ¾ in. in dia and 4 in. long, with upset heads. Embedded in the top slab, they offer the necessary shear lock.

The new highway bridge is a continuous structure of five equal 68-ft spans. Continuous girders, spaced about 7 ft c-c, are haunched, welded-plate sections, with steel plates for stiffeners. Studs were welded along the girder's 14-in.-wide top flange in all regions of positive moment, but were omitted in negative-moment portions, where haunches provided additional depth to enable the flanges to take the stresses.

Welding was done in a shop 200 miles from the site. The rows of studs, six per row, were spaced from 12 in. to 24 in. apart along the top flange. The welder positioned the studs in each row with a wood frame, then applied a welding gun fed by a 2,000-amp generator. After completion the girders were carried to the job by truck, then hoisted into place.

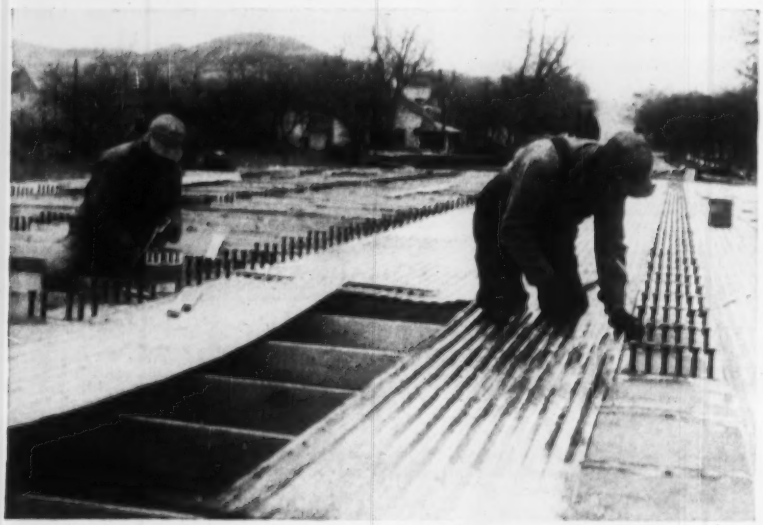
Once the girders were erected, the wood falsework for the deck was put up. This provided the support for light-gage corrugated metal forms for the slab. These metal sheets were left in place after the concrete was cast.

Among the advantages claimed for the studs are speed of installation, and adaptability as spacers for reinforcing. The fabricators tack weld the spacer bars on the studs.

Use of the novel shear connectors is backed by research—including fatigue tests of the studs themselves. Recommended stud diameters based on these tests are ¾ and ⅞ in. Studs can be produced in lengths up to 8 in.

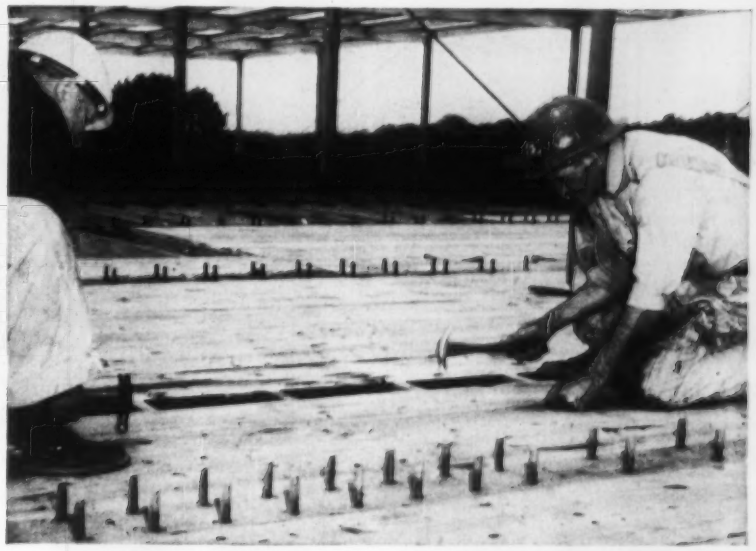
Studs for shear transfer are also to be employed on two more bridges in South Dakota, and on bridges in Georgia, California and New Jersey. In addition, this system is specified as a design alternate in 22 states.

The Fort Pierre Bridge was designed by Kenneth Scurr, bridge engineer for the state of South Dakota. The fabricator was the Egger-Scudder Co., Sioux Falls, S. D. Shear studs were supplied by the Nelson Stud Welding Division, Gregory Industries, Inc., Lorain, Ohio.



CORRUGATED STEEL SHEETS laid over wood falsework serve as forms for bridge's concrete deck. Studs welded along girder's top flange provided shear lock.

Costs of Composite Construction



In a building:

- Aids rapid construction
- Makes easy stacking of beams

Philip P. Page, Jr.
Supervising Engineer
Seelye, Stevenson, Value & Knecht
New York, N. Y.

Welded studs are finding a new application in buildings, having been used for years on wall panels and suspended ceilings. In the composite steel-beam, concrete-slab construction of a new research building for International Business Machines Corp. at Poughkeepsie, N. Y., ¾-in. studs were used as shear connectors. Welded to the top flange of the beams, the studs made possible reduced depth and weights of beams with no greater deflection for the same span.

The project consists of two buildings joined together by a 36-ft-long, 12-ft-wide two-story passageway. One building is 74 x 289 ft, the other 110 x 217 ft. The first floors of the two-story buildings are slab-on-ground; the second, composite-beam construction; and the roof, cantilevered steel girders with poured gypsum deck.

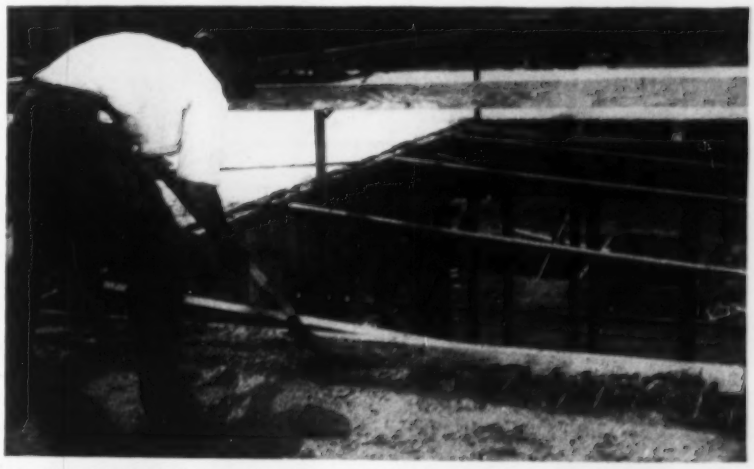
Greatest money saving was accomplished on the second floor. By relying on composite action, the amount of steel was reduced from 8.9 to 6.0 lb per sq ft. Also, by reducing the depth of beam, the design increased air-conditioning duct space.

To permit the composite action to apply to both live and dead loads, the beams were shored at midspan until the floor slab attained sufficient strength. This was the only shoring necessary, since the slab forms were carried by joists wedged up from the bottom flange of the beams. Because of modular design, it was possible to frame about 90% of the 45,000-sq-ft floor with one typical beam and one typical girder.

• **Spirals or studs?**—The method of transferring the horizontal shear from the upper flange to the concrete was originally designed with spiral connectors. An alternate with welded stud shear connectors was also specified. The successful steel bidder elected to use the alternate, attaching the studs in the shop.

The stud shear connectors had numerous advantages. They were much quicker to place than the spirals. They also permitted easy stacking of the beams in the shop, since cribbing could be slipped in between the studs to support the next layer of steel. There was no evidence of distortion either from the coverplate or from the stud welding. This freedom from distortion was important, since the building's exterior was to be porcelain-enameled panels set in aluminum mullions, which required steel set to close tolerances.

The design was made according to accepted standards. Concrete used had a compressive strength of 3,000 psi and an n of 10. The width of



FRESH CONCRETE was placed around ¾-in.-dia stud shear connectors. A steel reduction of 33% was made possible by integrating concrete floor and steel beams.

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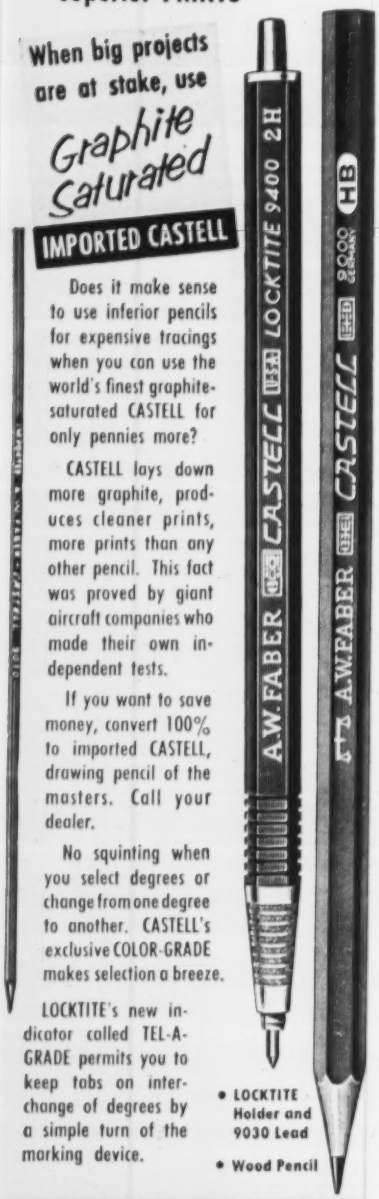
No squinting when you select degrees or change from one degree to another. CASTELL's exclusive COLOR-GRADE makes selection a breeze.

LOCKTITE's new indicator called TEL-A-GRADE permits you to keep tabs on interchange of degrees by a simple turn of the marking device.



• LOCKTITE Holder and 9030 Lead

• Wood Pencil

A.W. FABER-CASTELL
PENCIL CO., INC. NEWARK 3, N. J.

concrete for composite action was chosen in accordance with the ACI code in regard to flanges of T-beams.

The spandrel beams, however, were not designed as composite due to the eccentricity of the concrete flange, the lighter load, and the availability of more depth.

Composite construction offers the engineer a method of conserving steel and reducing the cost of construction; stud shear connectors provide a new means of economical composite action. Apparently, the use of this system did not increase the unit cost of fabrication. The bid for the steel was about $220 per ton, which compares favorably with bids for standard structural steel.

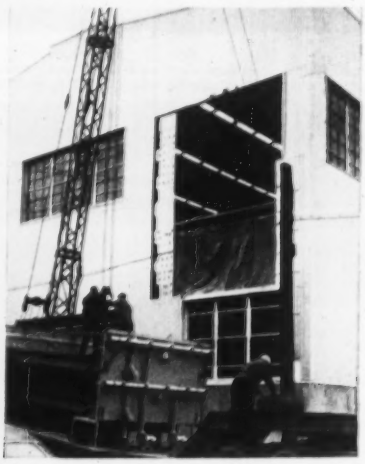
The structure was designed by the author under the supervision of Gilbert D. Fish. The architect is Eliot Noyes and Assoc., New Canaan, Conn., and Seelye, Stevenson, Value & Kneecht, New York City, are the structural, mechanical, and electrical engineers. The general contractor is Turner-Campbell, of New York and Poughkeepsie.

Fabricated by Bethlehem Fabricators, Bethlehem, Pa., the steel was erected by the Eddy Erecting Co., Long Island City, N. Y.

Makes Surfacing Stick

Following the lead of the Colorado Department of Highways, the City and County of Denver is successfully using wire fabric as a part of asphalt surfacing on wooden bridge decks. Here, half the roadway of the 70-year-old 38th St. Bridge in Denver has been covered by 20-ft lengths of 4x4, 10/10 welded wire fabric. They are fastened in place by 3-in. wood staples, preparatory to placing of tack coat and 2½ in. of dense graded hot asphaltic mix, which was later compacted by roller.

Novel Walls Are . . .



. . . Dormant Doors

Fluted aluminum panels, separated by a 1½-in. thickness of cellular-glass insulation, were selected for the walls of a new bottling plant for Duquesne Brewing Co. in Pittsburgh. Reason for the decision—the walls can be dismantled easily, to bring in large equipment or to expand the plant.

In addition to achieving this primary objective, the novel wall offers low weight (1.9 psf), low heat-transmission coefficient ($U=0.18$), low panel thickness ($t=3\frac{1}{2}$ in.), and best of all a low-cost-erected of $1.31 psf. Cellular-glass insulation was chosen because of its imperviousness, in view of the high humidity expected inside. The ribs of the fluted aluminum siding are to serve as miniature "chimneys" to carry off the condensation.

The 23,650-sq-ft sandwich wall was constructed on the site. First, the backup sheet of fluted aluminum siding was set in place against supporting members. Holes were drilled into the steel supports, after which screws were inserted to anchor the backup sheet. Cellular-glass blocks

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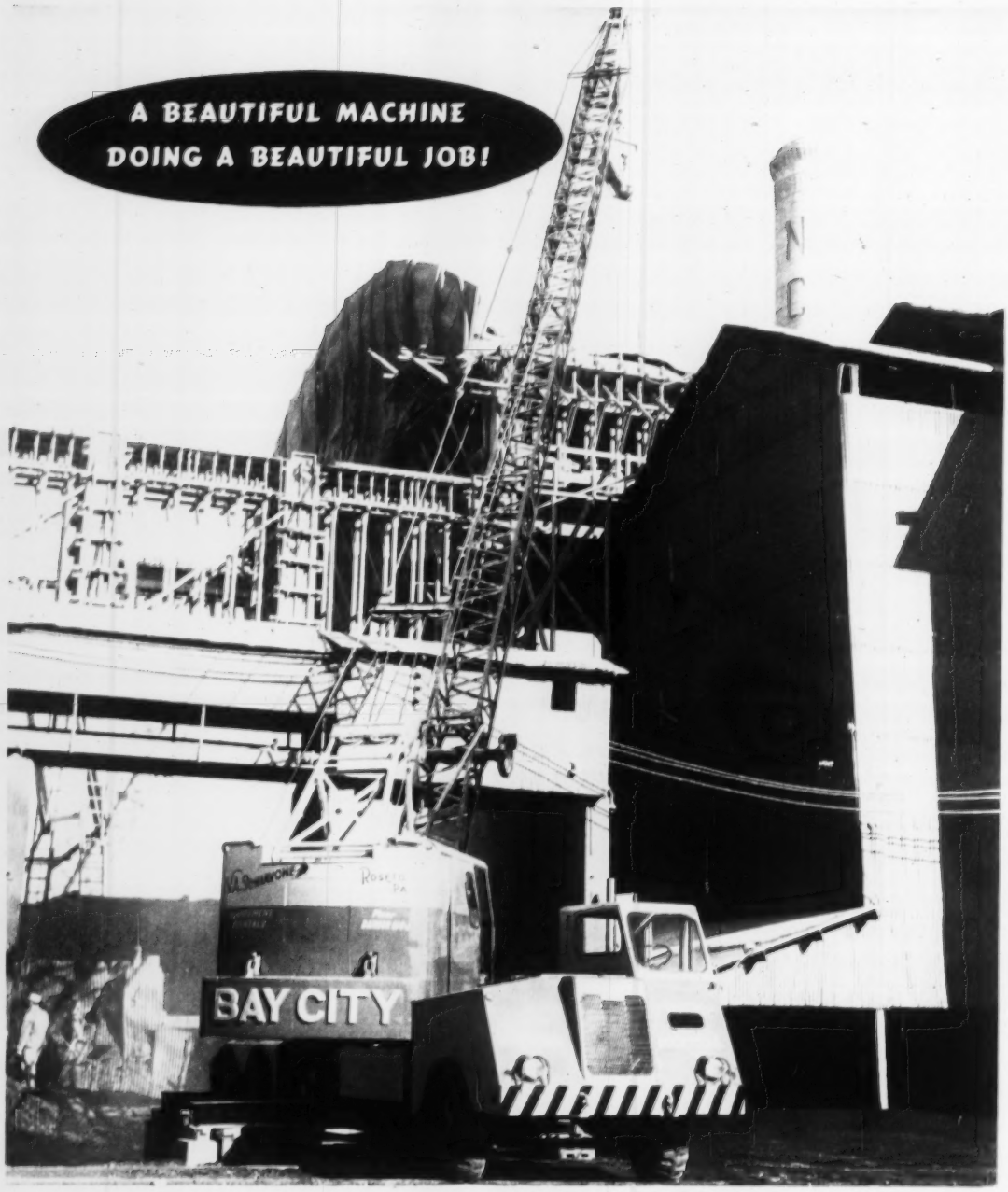

BAY CITY 25 TON CRANEMOBILE TAKES CONCRETE 105 FEET UP!

Equipped with 105 feet of boom, this BAY CITY 25 ton CraneMobile is placing concrete on a fast, smooth cycle in Nazareth, Pa. The CraneMobile will raise maximum boom from horizontal without help from another crane. An independent worm boom hoist raises and lowers boom or boom and load through reversing clutches under power, thus giving complete control of boom operations at all times. This highly mobile, rubber-tired BAY CITY is available in a range of capacities up to 25 tons, and in a selection of carriers to fit the job. High Gantry collapses for travelling to 11'8" overall height and the pin-connected boom requires little time for boom length changes. Write today for your CraneMobile catalog or see your nearest dealer.

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BAY CITY

SHOVELS • CRANES • HOES
DRAGLINES • CLAMSHELLS

261

were then placed against the backup sheet and temporarily secured with an adhesive. Over the insulation went aluminum facing sheets.

Next, holes on 8-in. centers were drilled through facing, insulation, backup and supporting frame. Finally, each complete sandwich panel was secured with stainless steel screws plus neoprene and aluminum washers.

For the building, E. G. Smith Co. of Emsworth, Pa., was the erection contractor, Rea Construction Co., the general contractor. Design was by Peth & Reed, engineers, Pittsburgh.

Water Resources Seminars To Be Conducted by Harvard

Starting in September, and involving one session a week, a program of research in water resources will be launched by Harvard University under a grant of $150,000 from the Rockefeller Foundation.

The weekly seminars will include ten Fellows drawn from industry, government and agriculture, who will be nominated through their various agencies for a course of training in the application of engineering techniques to the development of water resources and reclamation.

The training program will take ten Fellows each year for three years. It will cover social sciences, hydraulics and sanitation. It is not intended to discover new techniques; it is rather a group study of how properly to apply—or to find new applications for—techniques already available.

Experts from industry and government will be invited to address the seminars. Arthur Maass, associate professor of economics, has been placed in charge of the seminars.

Parking Lot Sits on Riverfront Fill

When Jacksonville, Fla., city fathers went looking for a place to put a really sizeable parking lot, they found the ideal spot literally in the city's front yard.

And at the same time, they converted an unsightly riverfront area—replete with rotting piles and other appurtenances—into an area beautification project that includes palm trees. But the most beautiful part of all, from the viewpoint of financial experts, is that the $4,188,750 cost will be covered by parking receipts.

The new parking facility is adjacent to the downtown business section, and flanks the Main Street Bridge across the St. John's River, a principal artery, that carries much of Florida's East Coast tourist traffic.

The lot, officially opened in mid-February, is 400 ft wide and 1,600 ft long, and is connected to the bridge by ramps.

Construction required removing a 2 to 15-ft muck layer that formed the river bottom, and replacing this material and making additional fill with clean sand from the river channel. Dredges brought up the fill, loaded into hopper-bottomed scows for dumping on the site. Draglines working from the shore placed the fill. Also included in the construction was steel sheetpiling around the three sides of the fill.

Engineers discarded the idea of installing sand drains to compact the muck because of the difficulty of providing adequate surcharge material, and a short time allowance.

Reynolds, Smith & Hills of Jacksonville were designing and supervising engineers. Duval Engineering & Contracting Co. of Jacksonville were contractors. Parsons, Brinckerhoff, Hall & Macdonald of New York were consultants on layout and traffic.

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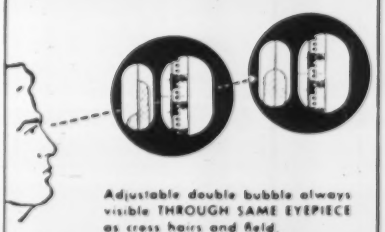

Adjustable double bubble always visible THROUGH SAME EYEPIECE as cross hairs and field.

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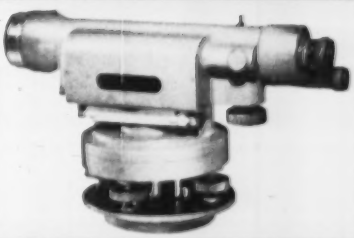

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for
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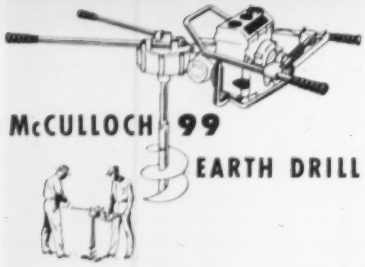

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EARTH DRILL

- Digs post holes quickly at any angle, in any terrain, in any soil
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- Digs soil-test samples conveniently
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- Converts into heavy-duty chain saw for cutting timber
- Will reverse direction of rotation
- Available with choice of augers
- Exceptionally powerful and light in weight

McCULLOCH
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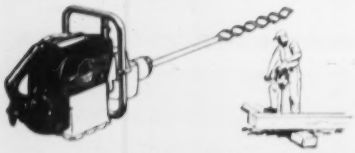
High-speed, light-weight tool saves time cutting brush. Easily operated by one man. Converts into one-man chain saw, or drill shown below.



McCULLOCH ALL-PURPOSE DRILL

For stump blasting, linework, bridge work, and other construction; also drills rock and soil and works with Jacobs chuck. Converts into one-man chain saw, or brush cutter shown above.

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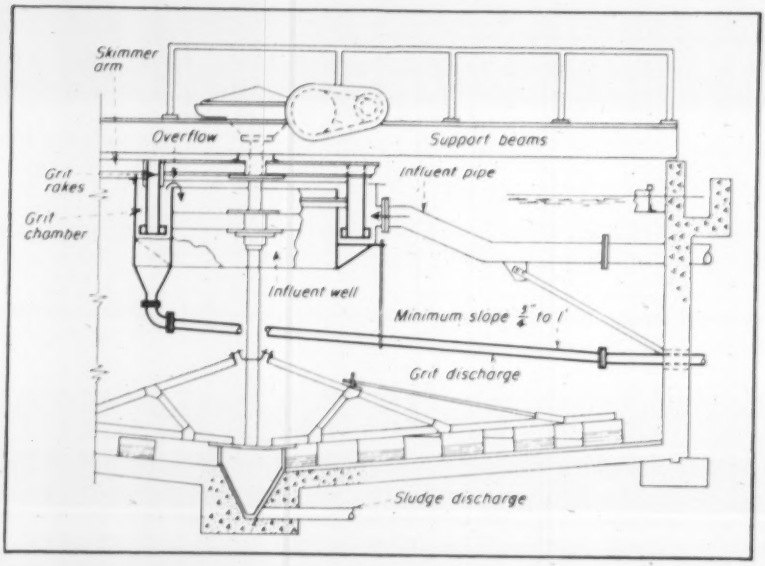


Grit Chamber Built Into Clarifier

A grit removal apparatus that is built into its clarifiers and clarifier-digestors has been developed by Dorr-Oliver, Inc. It consists of a modification to the feed well of the company's standard Type "A" units.

The standard influent pipe to a center feedwell is used while the grit chamber itself is an annular flume around the periphery of the feed well. Grit chamber effluent overflows over a weir into the feed well and then on through the sedimentation unit in standard fashion.

Rakes attached to the skimmer arm accomplish actual grit removal, and by their rotation cause a washing action as they carry settled grit to a draw-off

New Carrier for Ready-Mix Trucks

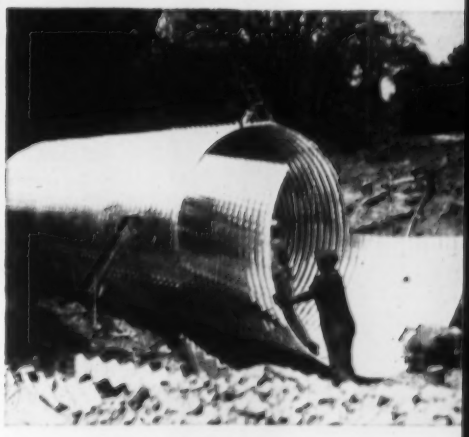
The Oshkosh Model 18-34 6x6, designed and built to meet contractor's demands for a concrete carrier that could handle mixers of 5½ yd and more in capacity, is now available.

The new carrier provides weight distribution of 18,000 lb on the front axle and 34,000 lb on the rear axle. Power steering is standard equipment, and, with short wheelbase, the machine is assured good maneuverability in traffic. Additionally, the manufacturer notes that power on all three driving axles provides 6-wheel drive traction for on- and off-highway hauling and spotting loads anywhere even during bad weather and on rough ground. Oshkosh Motor Truck, Inc., Oshkosh, Wis.

NOW AVAILABLE

AMBRIDGE Sectional Plate

for any shape or size of pipe, arch, or pipe-arch



to save you time and money in building low-cost drainage structures

AMBRIDGE Sectional Plate for Pipes, Arches and Pipe-arches is fabricated to meet the specifications of the American Association of State Highway Officials and can be adapted to all state, railroad and government specifications.

The plate is fabricated with 2″ deep corrugations on 6″ centers with standard punching, *and galvanized after fabrication.*

AMBRIDGE Sectional Plate is furnished to accommodate any shape or size of pipe, arch, or pipe-arch, complete with bolts. Special details, such as asphalt coating, hook bolts, beveled ends, and skewed ends, are furnished as specified for each job.

For further information, we suggest that you contact the office nearest you. Or, an inquiry direct to our Pittsburgh headquarters will bring detailed information.

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UNITED STATES STEEL EXPORT COMPANY, NEW YORK

AMBRIDGE *Sectional* PLATE USS

UNITED STATES STEEL

COMMENT
from the
BUTLER ENGINEER

Of Ready Mix, Roadbuilders, Blocks and Awards

Very interesting, very gratifying, very sound is the sharp trend toward automation in the concrete products industry . . . When Butler Bin piloted the first completely automatic, one-man operated Roadbuilders Plant we expected the rush that followed. And Butler automatic, electronic batching, led to quick conversions in the Ready Mixed field.

And now we find that the concrete block field has been equally alert to see the tremendous advantages of automation in product control and in production economy.

•

Incidentally, Butler entered the automation field in the right position: first—and we still are.

•

And speaking of Roadbuilders set-ups, one of the fine national magazines, CONSTRUCTION EQUIPMENT, cited the Butler Automatic One-Man Roadbuilders as Product of the Month. This is an award made only after careful analysis and screening by a completely impartial board of judges. We're very proud — but we're *not* in the nose-in-the-air department. Head in the clouds maybe but feet very much on the ground — and determined to win the Award again. A sweeping bow to CONSTRUCTION EQUIPMENT. A martini will be hoisted in thanks by the Butler Engineer at 5:00 P.M. today. Maybe every day.

•

Went to the movies t'other night. Kim Novak in "Picnic". Those who can take their eyes off the delectable Miss Novac, will see a Butler Ready Mix Plant in the background in one scene. You missed the background? I don't wonder.

I'm Kim-minded,

The Butler Engineer

BUTLER BIN COMPANY
WAUKESHA, WISCONSIN

hopper. Grit in the hopper may be pumped off or flow off by gravity, the method used depending on local conditions.

The degritting devices are available incorporated in 20- to 40-ft-dia settling or settling-digestion units, with maximum flows of 0.44 to 1.75 mgd. These flows are based on an overflow rate of 1,400 gpd per sq ft in the sedimentation compartment. Degritting flumes are designed for 90% removal of 65 mesh or larger grit at maximum flow.

Recent company sponsored tests of the new grit removal apparatus indicated 2% putrescible content in the grit after decanting. However, normal contents of 10% are expected. Grit drawoff is by gravity and no clogging has been experienced. But since the hopper is shallow and adjacent to the bridge walkway, the discharge pipe is in a position to be rodded easily. DORR-OLIVER, INC., BARRY PLACE, STAMFORD, CONN.

Single Pass Crushing Plant Is Both Mobile, Adaptable

Designated the Pioneer No. 8, a new single pass portable crushing plant is being offered by Pioneer Engineering Works.

Designed for moderately high production at low initial and small maintenance costs, the plant is mounted intact on a single rubber-tired chassis for the utmost in mobility. According to the manufacturer some of the special features of the new plant include: adaptability and mobility; choice of two sizes of jaw crushers; rejection of sand by a 16 in. x 20 ft sand conveyor is possible; either a front dolly or a semi-trailer hitch is obtainable, and various methods of feeding and delivering materials can be used. Before moving the rig from one job to another, only the sand delivery conveyor need be attached. PIONEER ENGINEERING WORKS, INC., 1515 CENTRAL AVE., MINNEAPOLIS 13, MINN.

Twin-Engined Tractor Packs 416 HP

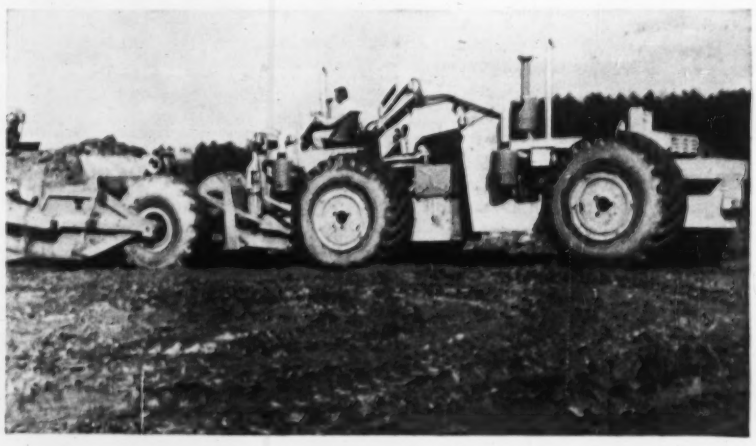
Now coming off the assembly line is the new model Twin-C, said by its manufacturer to be the most powerful tractor in the world.

With a total of 416 hp in its two engines, the machine weighs more than 40 tons and is capable of speeds up to 20 mph. Engineers for the LeTourneau-Westinghouse Co., manufacturers, claim for their machine the two elements of great power and high speed necessary for top production with the big scrapers now available to contractors.

A number of design features are aimed at giving the big rig maximum pulling and pushing power from its twin diesels. Six-foot-high tires provide 2-ft-5-in. ground gripping traction at each wheel to take advantage of the weight. The tires are hydroflated and are equipped with wheel weights in addition. All four wheels are drive wheels with equal weight distribution on each.

With speeds of 20 mph forward and 5.8 mph in reverse, the machine is said to match the pace of self-propelled scrapers. Controls are electric, to give the machine positive power steering and to power a unique floating push bowl. Another feature is articulated steering which allows all four wheels to apply maximum pushing or pulling power even in the tightest turns. LETOURNEAU-WESTINGHOUSE CO., PEORIA, ILL.

(*New Products continued on page 56*)



New P. H. Glatfelter Company Paper mill at Spring Grove, Pa. averages 615' x 100' x 65' overall. Erector: Belmont Iron Works, Phila., Pa.; Engineers: J. E. Sirrine Company, Greenville, S. C.; General Contractor: R. S. Noonan, Inc., York, Pa.

Two-man crews assemble steel expertly and fast using impact and holding wrench.

BOLTS make joints **STRONGER**

RB&W high strength bolts fortify paper mill against vibration ...save time in construction, too

THIS STRUCTURE is built to last. While there will be plenty of vibration and dynamic stress when 430-ft. paper making machine starts rolling . . . when a 30-ton crane spanning 50 feet starts working... the joints will stay tight.

Belmont Iron Works of Philadelphia assured this by erecting the 2000 tons of steelwork with RB&W high strength bolts.

High strength bolts are stronger and safer to install than rivets. Torqued almost to yield strength, they permanently clamp members without loosening. With higher residual tension, they give much greater resistance to fatigue from changing loads. Recent tests prove they develop *optimum* shear strength in a joint.

Bolting is also a time-saving, cost-cutting operation. Two-man crews do the installing . . . and can be quickly trained on the job, even in out-of-way locations. Ironworkers like the uniformity of threads and ease of handling of RB&W bolts. They know they can depend on RB&W quality on all jobs . . . buildings, bridges, equipment.

New RB&W Bulletin HS-1 gives all the information a man needs to work expertly with high strength bolts. How many copies would you like?

Russell, Burdsall & Ward Bolt and Nut Company, Port Chester, New York . . . *largest independent producer of high strength bolts for construction.*

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Nine EM Barracks Buildings
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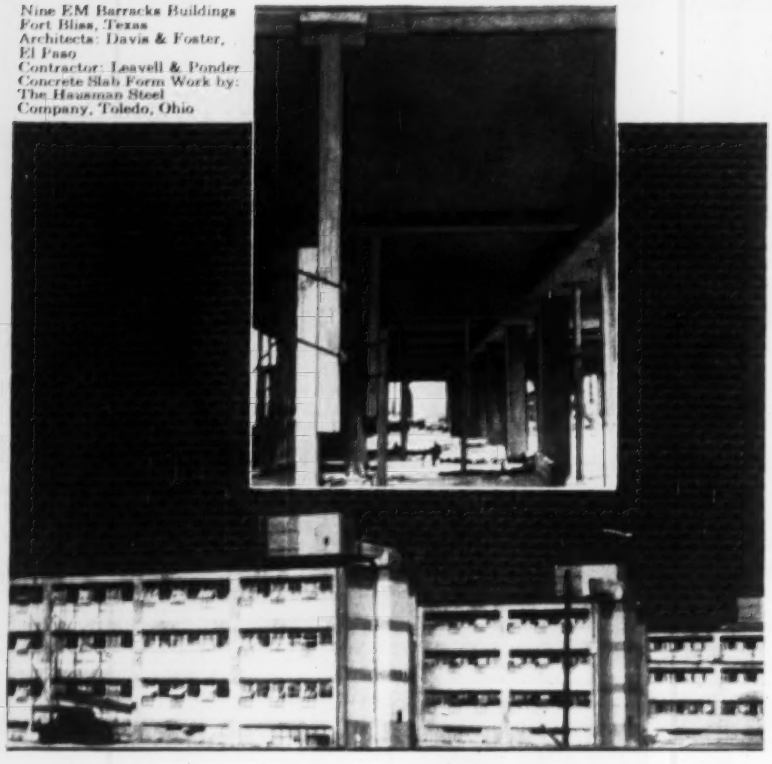
Architects: Davis & Foster, El Paso
Contractor: Leavell & Ponder
Concrete Slab Form Work by: The Hausman Steel Company, Toledo, Ohio



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Smooth, blemish-free architectural concrete, time after time, with the same forms.

That's what Masonite Concrete Form Presdwood® created for the contractor on this job. These dense, grainless panels brought substantial savings, too—in the cost of materials, in forming and ***finishing*** costs.

You can save time and money on your next job. Concrete Form Presdwood panels are easy to work with ordinary tools. Never split, splinter or crack. Large 4′ x 8′ and 4′ x 12′ sizes create fewer fins. Send for a sample. Use the coupon now.

Cut Costs 3 Ways!

1. Screen side to concrete—for unpainted surfaces. Tiny projections left in concrete cut hand-rubbing costs up to 50%.
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Please send me a sample of Concrete Form Presdwood and your free booklet on cutting costs three ways.

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Zone.....*County*.....

. . . New Products

Pocket Penetrometer For Soils Lab and Field Work

Classification of cohesive types of soils can be made by a screw-driver size instrument now available. Price: $15.00 fob Chicago.

It is practical for use on construction sites and in preliminary laboratory determination of soil shear strength.

The penetrometer piston is pushed into the soil up to a calibration groove. A pointer attached to the penetrometer's calibrated spring assembly indicates the reading in tons per square foot or kilograms per square centimeter unconfined compressive strength.

The complete penetrometer weighs only four ounces. It has a diameter of ¾ inches and is less than 7⅝ inches long. Soiltest, Inc., 4711 W. North Avenue, Chicago 39, Ill.

Easy-to-Use Charts Replace Slide Rule for Computing

Two mathematical charts are designed to get rid of computing blues. Like slide rules, they can be used for multiplication and division, as well as to find the square and cube root or logarithm of a number. No straight edge is required. Values can be read directly by merely locating intersections with a finger or pencil point.

Called "Calculine" charts, they are furnished on heavy 8½ x 11-in. card stock, and are inexpensive. Essentially, they consist of a log scale superimposed diagonally on a log log grid. There are two types: a multiplication and division chart, and a multiphase mathematical chart. The latter differs from the former only in that it has extra curves over the log log field to give square and cube roots or logarithms.

The cards, which come three-hole punched, were developed by E. J. George, now an engineer with the Sun Oil Co., when he was a college instructor.

Advantages claimed for the charts are that they are useful for field calculations—easily inserted in the back of notebooks for reference; they can be placed under desk tops for computations during the day; and they are a convenient conference-room aid. Charts come with sample calculations printed on them. FREDERICK POST CO., 3666 N. AVONDALE AVENUE, CHICAGO 18, ILL.

New Clamshell Bucket Speeds Shaft Mucking, Excavating

Specifically designed to speed shaft mucking and excavating, Blaw-Knox Co. introduces a new type clamshell bucket.

A pneumatic closing type, for use with single drum hoists, the clamshell is said to be the first to be produced by a major bucket manufacturer with integrally contained power closing. Both the ¾ and ⅞ cu yd sizes are designed to accommodate either the Ingersoll-Rand or the Gardner-Denver air hoist. The bucket operates on 85 to 100 lb of air pressure, the same as required for operation of other shaft drilling equipment. BLAW-KNOX CO., PITTSBURGH, PA.

Rock Bit in Six-Inch Size

The Chicago Brunner & Lay Rock Bit Corp. has announced the addition of a 6-in. Rok-Master bit to its line of percussion rock-drill bits. The bit is for use on I-R Quarrymaster drills, and features 2x3 threads, a tough bit body with fast drilling carbide inserts that are said to have unusual resistance to wear and shock. CHICAGO BRUNNER & LAY ROCK BIT CORP., 9300 KING ST., FRANKLIN PARK, ILL.

Lightweight Gas Engine

A new single cylinder 4-cycle, air-cooled gasoline engine has been announced by D. W. Onan & Sons, Inc. Claimed to deliver more horsepower hours per dollar, the engine was developed primarily as a prime mover for the firm's new line of lightweight, portable electric generating plants.

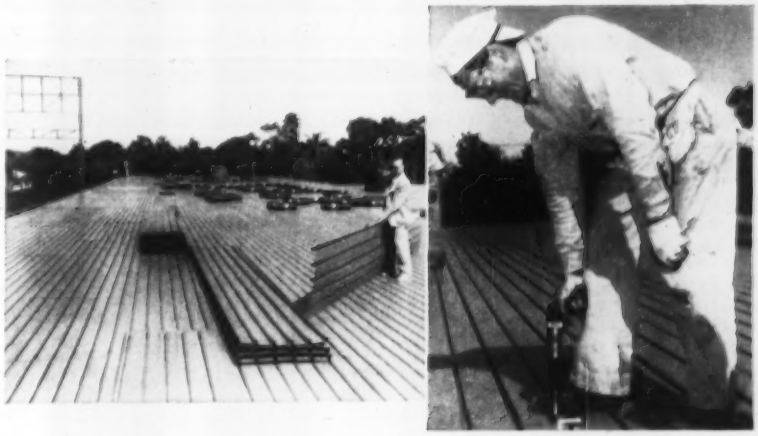
The Model AJ develops 5.5 hp at 3,600 rpm; has a 2¾ in. bore, a 2½ in. stroke; 14.9 cu in. piston displacement and a compression ratio of 6.25:1. D. W. ONAN & SONS, INC., MINNEAPOLIS 14, MINN.

DRIVE-IT®

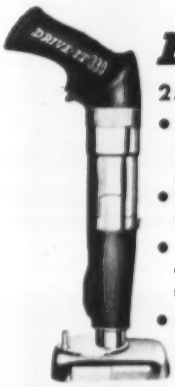
POWDER-ACTUATED TOOL

Cuts Fastening Costs

On Steel Decking Installation



J. S. Stephens and Sons, Tampa, Florida contractors, used DRIVE-IT tools to speed the installation of the steel decking used as the roof of the Dunedin Shopping Center. Mr. Stephens used two model 330 DRIVE-IT tools to drive over 4,000 drivepins to anchor the steel decking to the steel roof trusses. Installations of this type average about 75% savings over drilling and other outmoded fastening methods. If you fasten *anything* to concrete or steel—you can save with *DRIVE-IT* tools.



DRIVE-IT 330

25 CALIBER TOOL GIVES THESE ADVANTAGES

- **ONE POWER LOAD.** Only one strength power load needed—whether fastening into hard or soft concrete. No need to stock several strength loads.
- **INTERCHANGEABLE ¼" and ⅜" BARRELS.** One tool drives wide range of fasteners.
- **LIGHTWEIGHT, EASY-HANDLING DRIVE-IT 330** weighs only 6 pounds, is 15 inches long. Compact. Simple trigger operation speeds work.
- **SAFE.** Large safety pad plus built-in mechanism guards against accidental discharge, must be depressed against work before trigger can be pressed.

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☐ Send literature on *DRIVE-IT* tools. ☐ I want a free *DRIVE-IT* demonstration.

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NOW! The lowest-priced

Miles of extra life, with extra-strong chassis features! Up to 3000 lbs. more payload than other 6-wheelers!

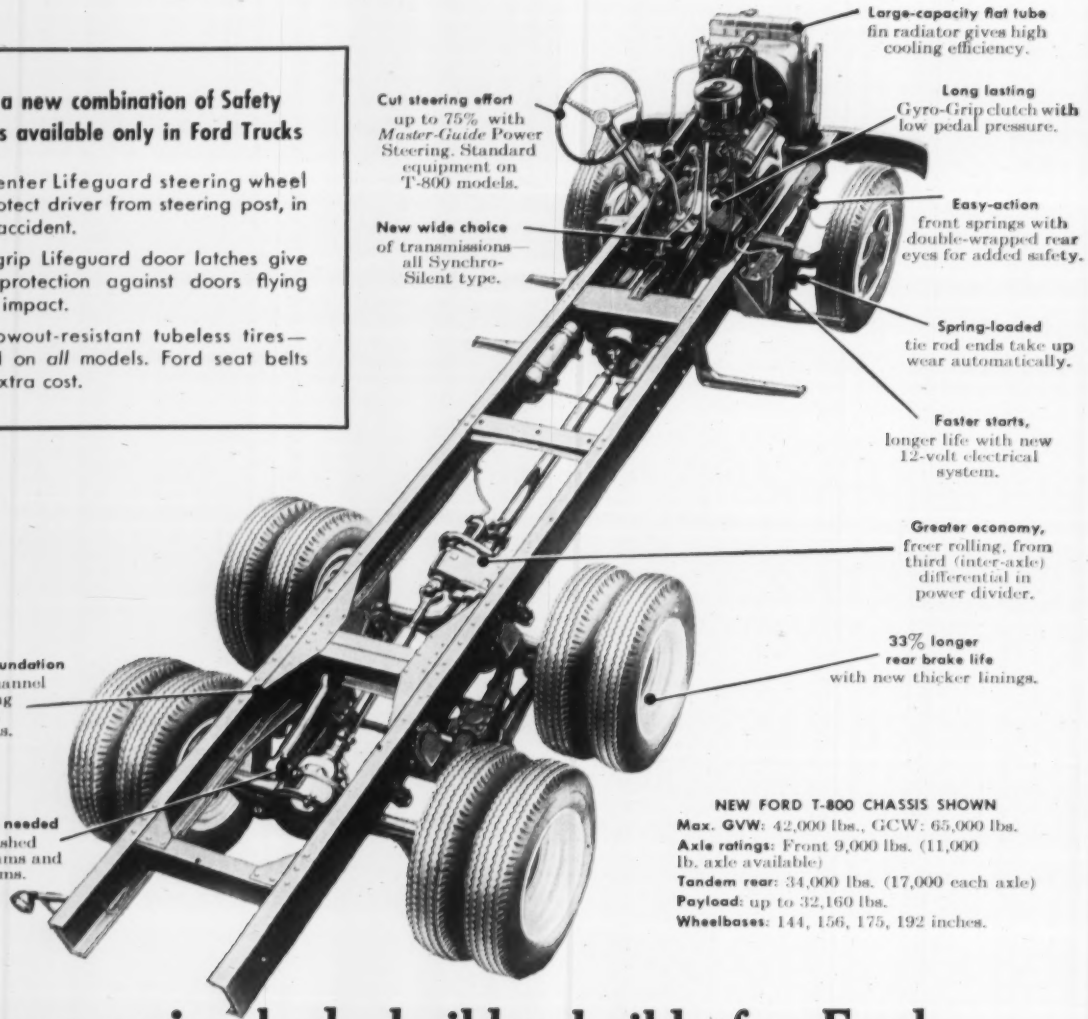
• Ford's new T-800 is the lowest-priced in its class—based on a comparison of manufacturers' suggested list prices. It also carries up to 3000 more lbs. of payload compared to other tandems *in the same GVW weight class!*

With a new combination of Safety Features available only in Ford Trucks

Deep-center Lifeguard steering wheel helps protect driver from steering post, in case of accident.

Double-grip Lifeguard door latches give added protection against doors flying open on impact.

New blowout-resistant tubeless tires—standard on *all* models. Ford seat belts at low extra cost.

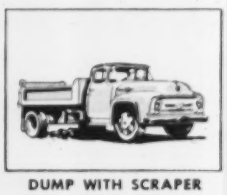

Large-capacity flat tube fin radiator gives high cooling efficiency.
Cut steering effort up to 75% with *Master-Guide* Power Steering. Standard equipment on T-800 models.
Long lasting Gyro-Grip clutch with low pedal pressure.
New wide choice of transmissions—all Synchro-Silent type.
Easy-action front springs with double-wrapped rear eyes for added safety.
Spring-loaded tie rod ends take up wear automatically.
Faster starts, longer life with new 12-volt electrical system.
Greater economy, freer rolling, from third (inter-axle) differential in power divider.
33% longer rear brake life with new thicker linings.
Rugged truck foundation from deep-channel frames, among the strongest on any trucks.
No lubrication needed—rubber-bushed equalizing beams and torque arms.

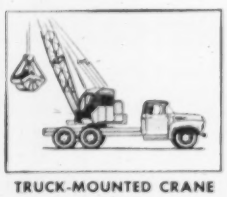
NEW FORD T-800 CHASSIS SHOWN
Max. GVW: 42,000 lbs., GCW: 65,000 lbs.
Axle ratings: Front 9,000 lbs. (11,000 lb. axle available)
Tandem rear: 34,000 lbs. (17,000 each axle)
Payload: up to 32,160 lbs.
Wheelbases: 144, 156, 175, 192 inches.

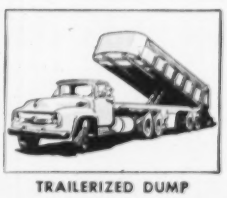
Every major body builder builds for Ford . . .

CEMENT MIXER TRUCK

DUMP TRUCK


DUMP WITH SCRAPER

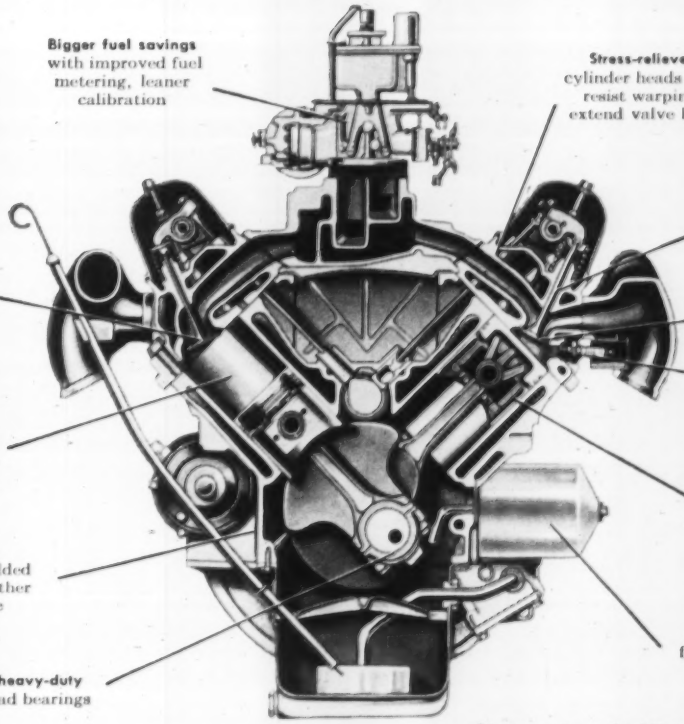

TRUCK-MOUNTED CRANE


TRAILERIZED DUMP

Tandem in its class-Ford T-800

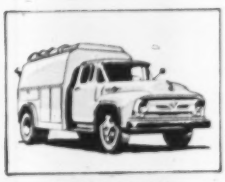
Longer-lived, dependable operation with exclusive heavy-duty engine features

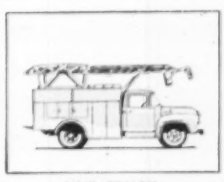
• '56 Ford Tandems offer you the most proven Short Stroke V-8 engines in the industry—*for better gas mileage, longer life, less maintenance costs.* And you get a combination of longer-lasting heavy-duty engine advancements found in no other truck. Ask your Ford Dealer for details.

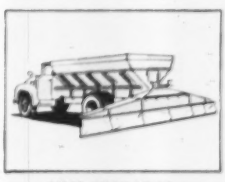

Bigger fuel savings with improved fuel metering, leaner calibration
Stress-relieved cylinder heads that resist warping, extend valve life*
225° cooler valves —new sodium-cooled exhaust valves with tungsten-cobalt facing*
Self-Sealing dish-type intake valves for tighter fit*
Durable, self-cleaning free-turn valves
Anti-fouling 18-mm. spark plugs with new long-life electrodes
Short Stroke design in *every* engine for greater gas savings, longer life
Expansion-controlled pistons with integral steel struts
Deep-block structure for added strength, smoother performance
Full-flow oil filter to clean *all* the oil for longer engine life
Durable heavy-duty copper-lead bearings

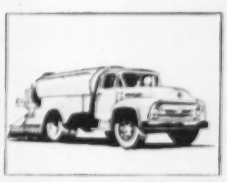
***Features of new Ford Heavy Duty engines . . .** 190-h.p. *Torque King* V-8 shown . . . 200-h.p. *Torque King Special* V-8 available.

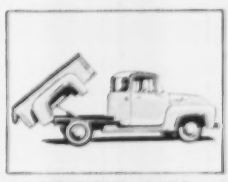
More fleets are buying Fords than any other make


UTILITY TRUCK


LINE TRUCK

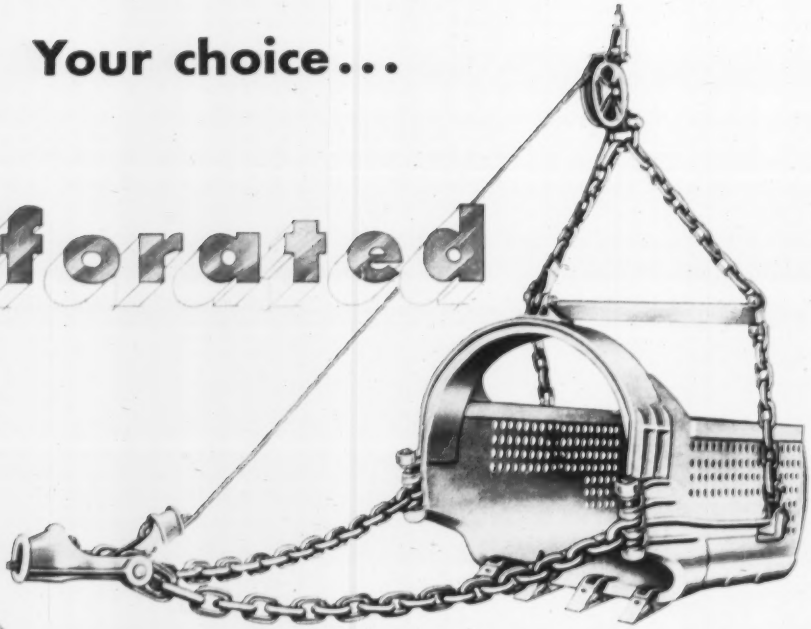

LIME SPREADER


BITUMINOUS DISTRIBUTOR


LIGHT DUTY DUMP

Your choice...

Perforated



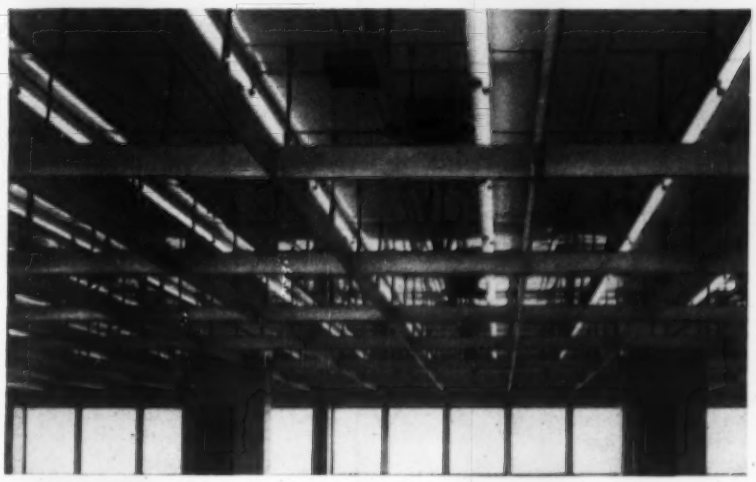
Solid

HENDRIX Dragline Buckets

A TYPE FOR EVERY DIGGING PURPOSE
¼ to 40 Cubic Yards

HENDRIX MANUFACTURING CO., Inc.
MANSFIELD, LOUISIANA

DIFFUSING plastic ceiling, checkered by sound baffle grid, hangs below . . .



REFLECTING steel surface, studded with lights, air vents, sprinkler heads.

Double Ceiling Cuts Light Loss

Sylvania Electric Products Co., Wheeling, W. Va., and C. F. McCullough, Chevrolet plant engineer, came up with a novel way to boost lighting efficiency when they designed the lighting system for Chevrolet's new engineering center, Warren, Mich. Adapting one of Sylvania's standard luminous ceilings (light sources above wall-to-wall translucent plastic), they added a continuous white-finished steel surface, 18 in. above the plastic. They estimate that secondary reflection (up from the plastic, then down from the steel) increases light output 40%—enough to justify the cost of the added ceiling.

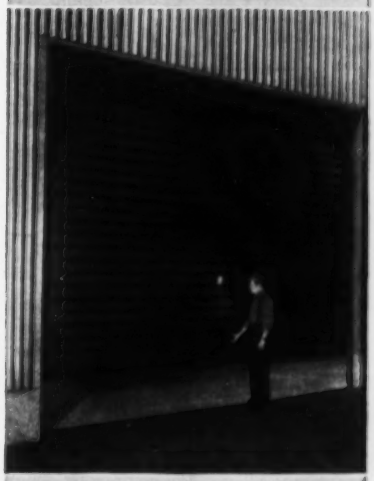
The diffusing plastic, a corrugated vinyl resin, is applied in 2-ft-wide strips. They are laid, but not fastened, on a suspended grid of extruded aluminum channels. When the strips need cleaning, workmen simply roll them up and wash them in automatic equipment.

Primary light sources are 477-v, instant-starting, single and double-lamp fluorescent strips. They are mounted in four, six and eight-foot luminaires, 2 ft c-c, just below the reflective ceiling. Single lamps are set off-center in the fixtures to allow future conversion to doubles.

Illumination at working level varies from 20 to 150 ft-c. This range is accomplished not only by total number of lamps, but also by a three-way switching arrangement that allows one-third, two thirds, or full illumination in any area.

The 18-in. space between metal ceiling and plastic serves also as an air

The
"COMMERCIAL INDUSTRIAL"
Model



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Roly-Door
STEEL SECTIONAL
OVERHEAD DOORS

CLEAN, MODERN FUNCTIONAL LINES that blend smoothly with all types of architecture are the hallmark of Morrison Roly-Doors.

SIMPLIFIED DESIGN ensures safe, easy, trouble-free installation and operation . . . manual, electrical and by remote control.

BONDERIZED, ALL-STEEL CONSTRUCTION provides lasting good looks and a durability that defies the weather and years of hard use.

ECONOMICAL INSTALLED COST made possible by sound engineering and precise mass production . . . Morrison Roly-Doors are competitively priced.

OVER 1000 STANDARD SIZES ready for immediate delivery provide a Morrison Roly-Door for every overhead door requirement.

PROMPT DELIVERY, EXPERT INSTALLATION SERVICE by Morrison Roly-Door Distributors and Dealer-Installers located in all principal cities.

Complete Information and Detailed Specifications are available from:

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MORRISON STEEL PRODUCTS, Inc.
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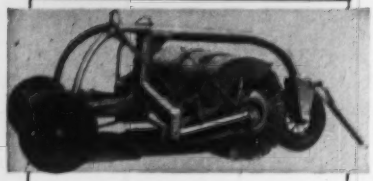
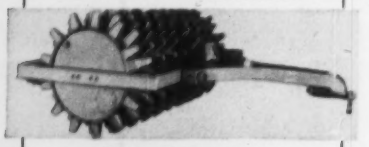
Grace
ASPHALT
AND COMPACTION
EQUIPMENT

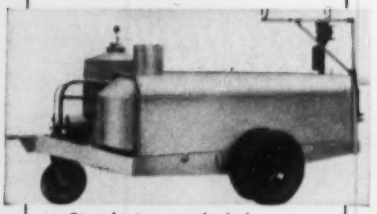


Roadsweepers, traction, engine-driven or tractor-mounted

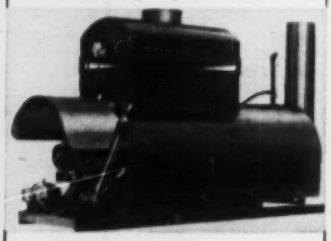


Sheepsfoot rollers

Chip spreaders



Circulating asphalt heaters



Automatic oil heaters for hot plants

Pneumatic rollers, self-propelled or trailed

W. E. GRACE MFG. CO.
6015 S. LAMAR, DALLAS, TEXAS

plenum. Conditioned air moves between plenum and working space through rows of small openings created where the corrugated sheet edges rest on the channel flanges. Such distribution of openings is said to diffuse the air with remarkable uniformity.

Shallow sound baffles, hung below the ceiling-support channels, control noise levels. Baffles were placed in a grid, at 2 to 8-ft spacing, depending on acoustical needs and, in some cases, appearance.

Architects and engineers of General Motors and Argonaut Realty Co., Detroit, designed the building. General contractor was Darin and Armstrong, Detroit.

Backwater Curves Computed by Machine

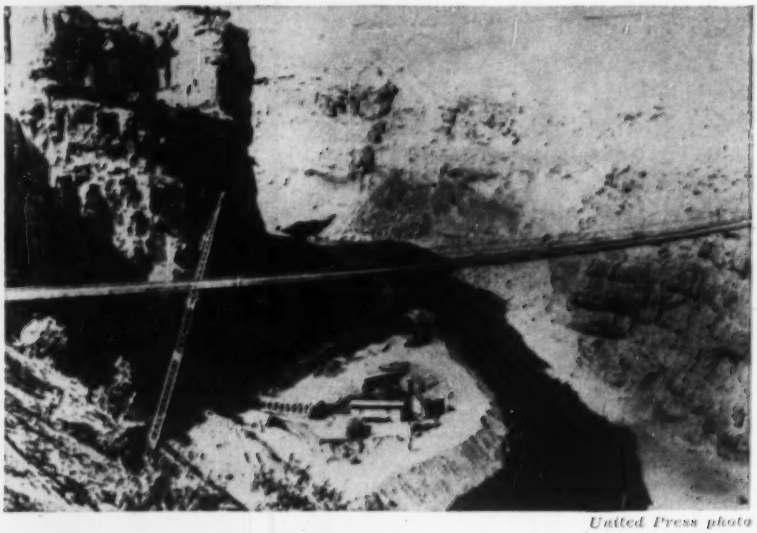
One machine did the work of 50 men on the calculations of backwater curves, so vital to the present hydraulic juggling of the St. Lawrence River.

The figures it produced have been of constant use to Canadian and U.S. engineers all along the 40-mi stretch of river from Barnhart Island to Lake Ontario, the International Rapids section that will be backed up behind structures of the $700-million seaway and power projects now under construction.

Computations for design of the powerhouse and the control structures were made on a British digital computer at the University of Toronto. The machine, made by Ferranti Electric in England, is the largest computer in Canada, although it is smaller in size and speed than the latest models now available in the U.S. The machine, called "Ferut" was able to produce results in a little over a year from the start of operations to the final report on a job which it was calculated would have taken 50 man-years to accomplish.

The resultant three sets of books of figures have been in constant use by Canadian and U.S. engineers on the St. Lawrence seaway and power project. The books and accompanying maps show a new set of backwater profiles on a 40-mi stretch of the river.

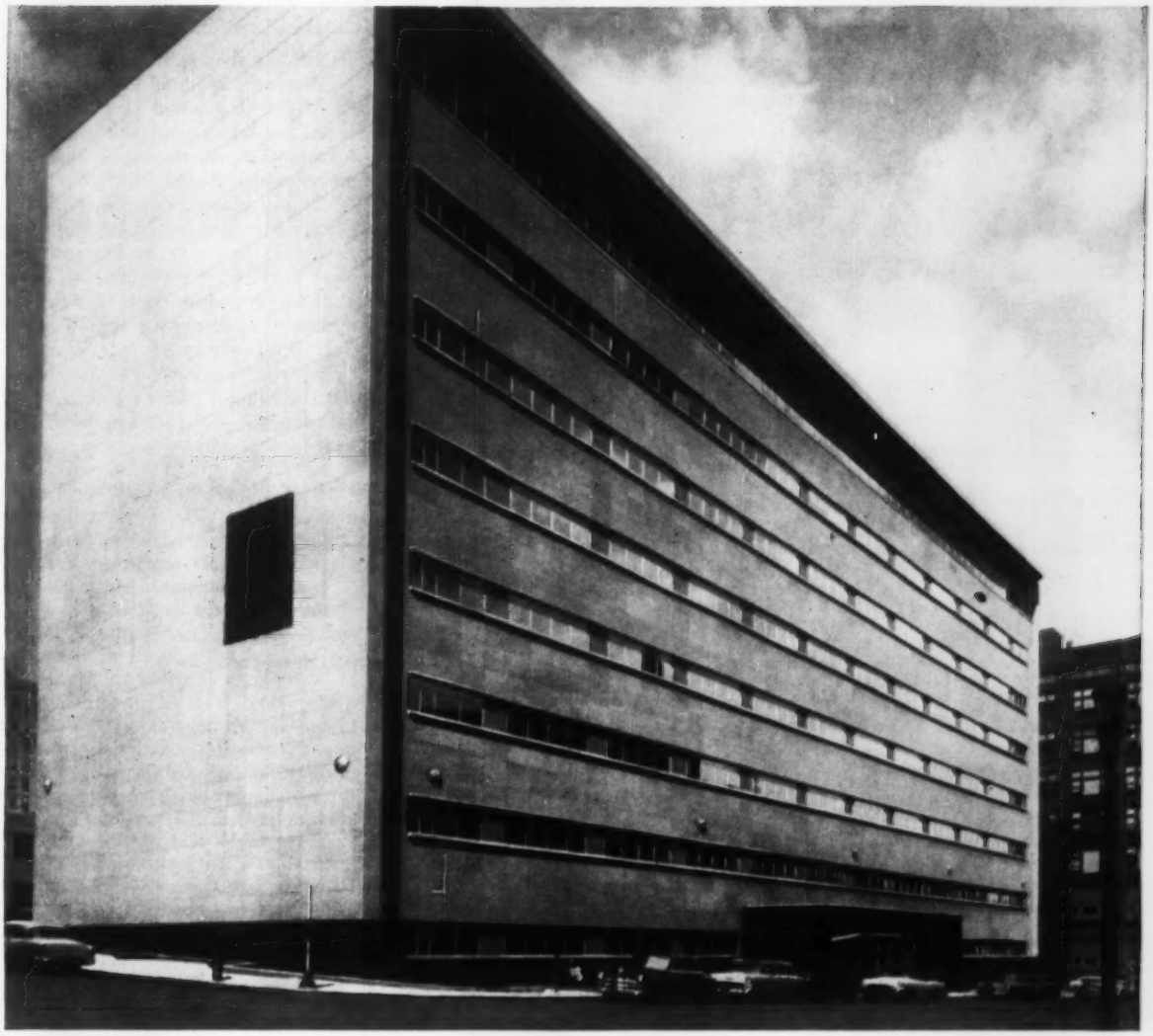
• **Problem was complicated**—At the time when data were being prepared for the backwater computations, little up-to-date information was available on channel roughness of the St. Lawrence River. It was decided to compute the backwater slopes using a range of roughness sufficiently wide to



United Press photo

Baby Suspension Bridge Carries Jeep

Work on Iraq's 385-ft-high, 1,170-ft-long Dokan Dam demands frequent trips back and forth across the gorge. Simplest solution is the narrow but lengthy suspension bridge shown which can accommodate a fully loaded jeep. (The $33-million dam will initially function for flood control and irrigation uses with power generation facilities to be added at a later date.)



Architect: Ellerbe and Co.; *General Contractor:* Wm. Baumeister Construction Co.; *Fabricator:* St. Paul Structural Steel Co.; *Erector:* N. H. Sandberg Erection Co. — all of St. Paul.

THEY USED BOLTED JOINTS FOR NEW BUILDING IN ST. PAUL

This block-long structure, completed recently at Victory Square in the Loop, St. Paul, is the head office building of Minnesota Mutual Life Insurance Company. The 8-story Kasota stone building has a steel framework of 1,122 tons. The structural members are joined by approximately 22,000 Bethlehem High-Strength Bolts.

Bethlehem High-Strength Bolts are ideal for joining structural members because of the saving they make possible in erection time. They are quickly installed by means of a calibrated pneumatic impact wrench, which applies sufficient torque to provide permanently tight joints. Besides, the wrench is far less noisy than a riveting gun, making high-strength bolting particularly desirable for construction near hospitals and schools, and in other areas where noise is especially objectionable.

Bethlehem High-Strength Bolts are made of carbon steel, are heat-treated by quenching and tempering, and meet the requirements of ASTM Specification A-325.

Why not let one of our engineers explain in detail the advantages of using Bethlehem High-Strength Bolts? A call to the nearest Bethlehem sales office will bring him to your desk promptly. Or write direct to us at Bethlehem, Pa.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.
On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM STEEL

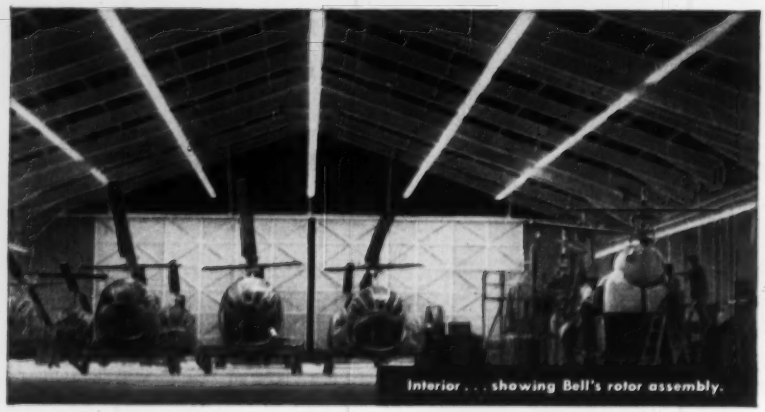
ANOTHER INDUSTRIAL LEADER...

Exterior view of new Luria installation.

BELL *Aircraft* CORPORATION
TEXAS DIVISION

Chooses

LURIA Standardized Buildings



Interior . . . showing Bell's rotor assembly.

THE "LURIA SYSTEM OF STANDARDIZATION" LOWERS YOUR BUILDING COSTS... AND ADDS HIGH SPEED TO YOUR INDUSTRIAL EXPANSION

One of the primary reasons why Luria Buildings were selected by Bell Aircraft ... and became a vital part of the world's most up-to-date facilities for manufacturing helicopters...was because these standardized buildings of structural steel components *surpass the requirements called for in the building codes.* But *permanency of structure* is just one of many assets provided by Luria. Among the others are *adaptability* and a *flexibility of design* that make possible almost *any* type of structure and almost *any* type of architectural treatment. As a result, Luria Buildings can be "custom-built" to your *individual* requirements ...without sacrificing the advantages of standardization.

LURIA ENGINEERING Company

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bracket the values eventually selected.

Data were required for the unimproved river channel, for the river with channel improvements, and for conditions of ice cover. Channel improvements included raising the water level to operate the Barnhart Island powerhouse, which is to supply some 1,000,000 hp each to Ontario and New York power commissions. Complicating the measurements were the numerous islands in the stretch of the river being measured. This required extra computations to determine waterflow in networks of islands which occupy 75% of the length of the river in that area.

• **Machine was versatile**—The "Ferut" machine does its computations by "programs" which are fed into the machine by paper teleprinter five-hole tape; answers are printed in page form at the end of the program. The machine made 99 basic computations for the range of water level, for the range of waterflow, and for the range of roughnesses. The machine was used to analyze all possible variables that might have developed. By manual calculations only about one-eighth of the variables could have been considered.

As a result of the data obtained from the "Ferut" machine, the Ontario Hydro-Electric Power Commission's model of the St. Lawrence Seaway and power project was built at Toronto; it has been of use to both U.S. and Canadian engineers on measurements for the power phase of the project.

Ontario Hydro uses other electronic computer machines at its headquarters at Toronto to obtain various sets of data for other projects. For instance, it used the International Business Machine 602A to compute surges in tunnels and the speed at which gates must be closed off at Niagara to keep surges to a minimum. The tunnels at Niagara are 5½ mi long and 48 ft in diameter, with water flowing from above the falls to the power station at 12 fps. It took Ontario Hydro engineers about a month to set up the data for the machine to use in making these computations. Then it took the calculating machine one day to make the computations.

The "Ferut" machine at the University of Toronto Physics Department, has also been used to make calculations on bridges for the Ontario Department of Highways; to provide data for defense projects involving the firing of guided missiles; Polar route; to make computations on ballistic problems and in aircraft design.

A Timely Word to Drafting Department Heads...

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✻ **Because your old reproduction unit can't keep pace with increased demands!**

✻ **Because, with management's desire for greater production, you can get top level approval for new equipment!**

You Need It! The boom in production means more pressure than ever for engineering prints. Modern Copyflex will help you deliver them! New, better-than-ever models bring you faster reproduction speed and a host of operator conveniences to step up production.

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Company _____

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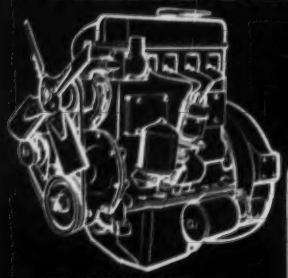
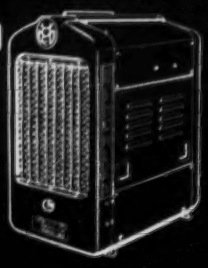
City _____ County _____ State _____

HERCULES ENGINES . . .

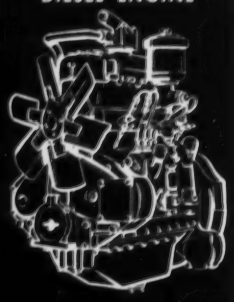


OVERHEAD VALVE GASOLINE ENGINE

CLOSED TYPE POWER UNIT

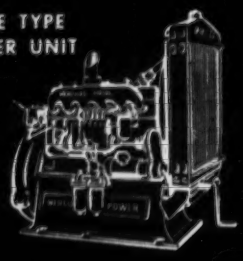


TURBULENCE CHAMBER DIESEL ENGINE

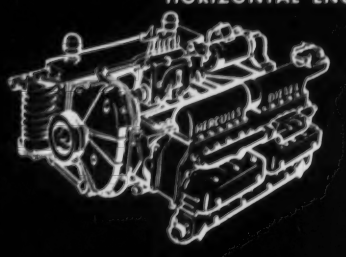


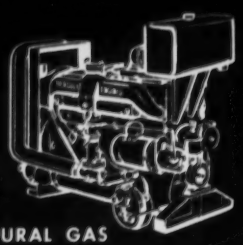
The complete line of engines and power units from 3 to 500 H. P.

BASE TYPE POWER UNIT

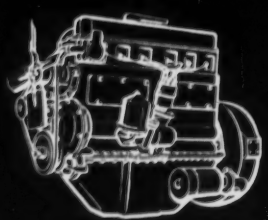


"PANCAKE" or HORIZONTAL ENGINE





NATURAL GAS L-HEAD ENGINE



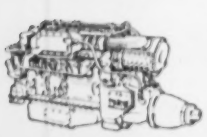
DIRECT INJECTION DIESEL ENGINE

The wide selection of engine types and sizes in the Hercules line, plus the flexibility of our production facilities provide a complete line of dependable power to meet the varied needs of many different industries.

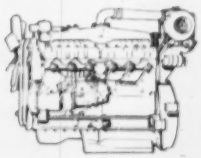
In addition to the various types of engines and power units illustrated, it is the policy of Hercules Motors Corporation to engineer and produce these engines to the specific requirements of each industry.

For assistance in solving your particular power problems, contact Hercules Motors Corporation—Engine Manufacturing Specialists since 1915.

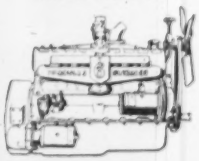
MARINE DIESEL



TURBO-CHARGED DIESEL



L-HEAD GASOLINE



HERCULES MOTORS CORPORATION
CANTON 2, OHIO

Research

Stream Capacity

Method uses statistical analysis of grab samples

A statistical analysis of simple grab samples collected over several months is the heart of a new method for evaluating stream capacity for waste disposal conceived by M. A. Churchill, chief of the TVA Stream Pollution Control Section.

No long-term biochemical oxygen demand incubations are required. No BOD curve analysis for presently used constants "k" and "L" is necessary. No time of water travel determinations need be made.

Churchill's basic theory is that dissolved oxygen concentration will vary downstream from the pollution load according to some function of BOD load, water temperature and stream discharge. He assumed a linear multiple correlation relationship between the three variables and the DO drop, expressed mathematically as

DO Drop = a + b(5-day BOD) + c(Temperature) + d(1/Discharge) where a, b, c and d are constants derived from analysis of grab sample data.

Churchill and other researchers have shown a linear relationship between BOD and DO drop. Temperature effects on DO drop are not as certain, but the TVA stream pollution chief chose the simple relationship, indicating that further study may dictate a refinement. His own experience has shown that if the reciprocal of stream discharge is plotted against DO drop, a linear relationship results.

First step in applying the new method is to obtain the sampling data. Four sampling stations must be located. Number 1 is spotted just upstream from the source of pollution. Station 2 should be as close below the source of pollution as will allow accurate determination of the weighted mean DO and BOD in the cross-section of the stream from multiple-point samples. Third sampling point is at or near the low point of the oxygen sag at low flow. The last station should be halfway up the recovery end of the sag curve at low flow.

At each of these stations, weekly observations of DO and water temperature are made. At the same time, a BOD sample is collected. Stream discharge should be known from a

(Continued on page 71)

Take a tip from builders of great American roads

Edsel Ford Expressway, *important new traffic artery in Detroit, Michigan, is reinforced with American Welded Wire Fabric*

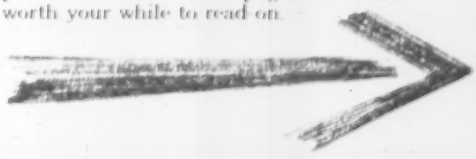
Take a tip from the Pennsylvania Turnpike Commission, the Ohio Turnpike Commission, the Indiana State Highway Department, and others who are lacing America together with a network of outstandingly fine superhighways and thruways. Take a tip from them and use quality construction materials manufactured by American Steel & Wire to increase the life, the comfort, and the safety of your new roads.

Make your Portland Cement concrete slabs 30% stronger, at extremely low cost, with American Welded Wire Fabric. You will find it easy to handle . . . readily available in any size and style you need (greatly expanded manufacturing facilities assure this).

Use longer concrete slabs for smooth riding, to reduce installation costs and speed construction. Use American Road Joints to provide proper load transfer for a balanced pavement design.

Help prevent off road crashes with Multisafty Cable Highway Guard and American Beam-type Highway Guard.

You will find interesting new applications of these fine products on the next few pages. We think it will be worth your while to read on.

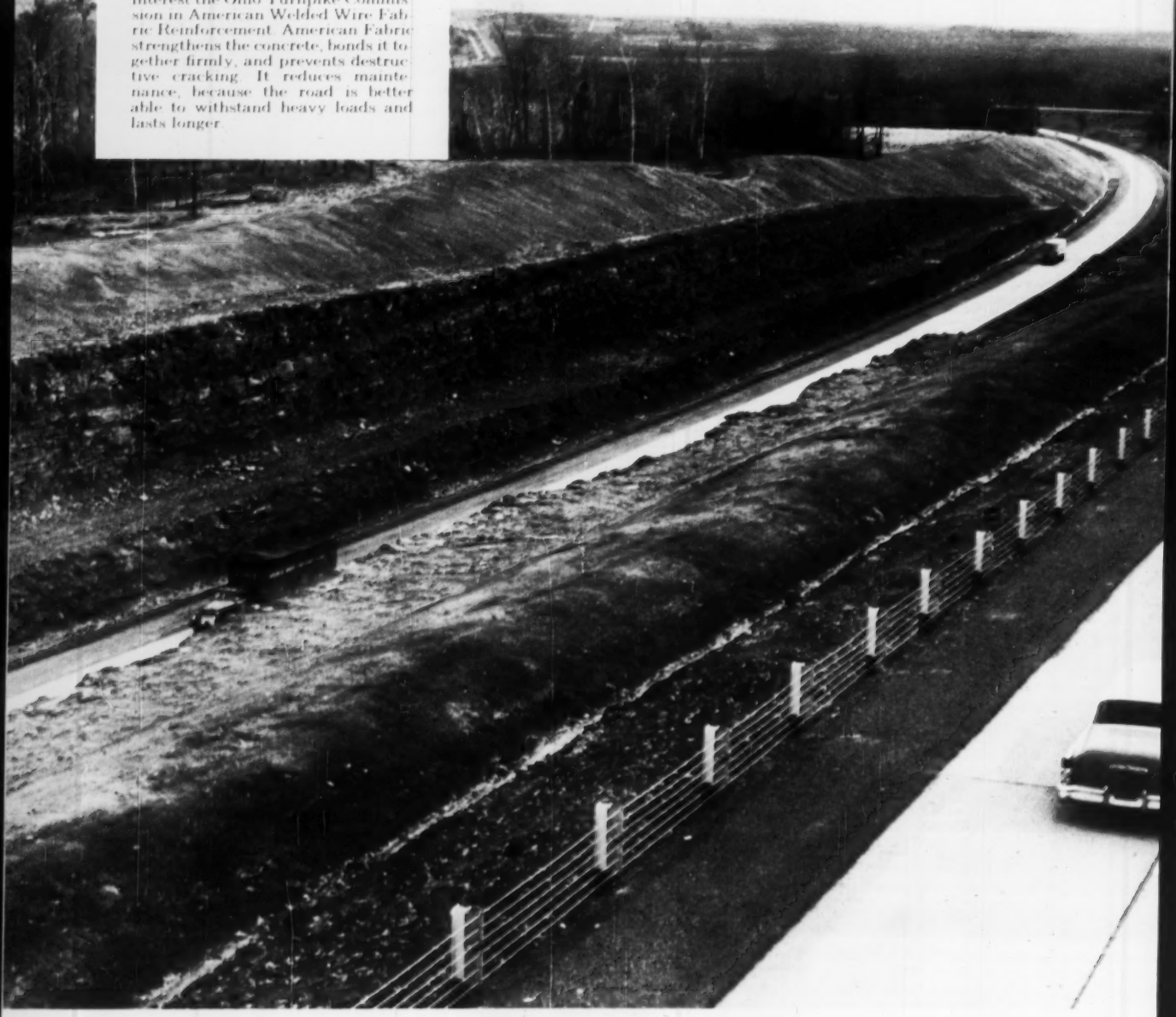


On a great "AMERICAN" road

. . . American Fabric and Road Joints reduce

. . . American Highway Guard reduces fatal

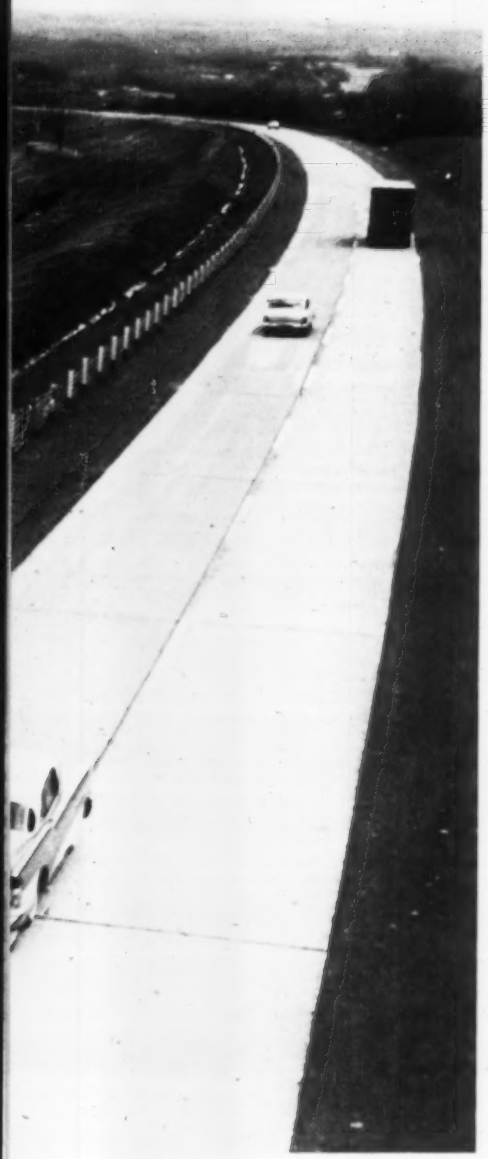
Smoother, more comfortable, and safer, too. These are the benefits that interest the Ohio Turnpike Commission in American Welded Wire Fabric Reinforcement. American Fabric strengthens the concrete, bonds it together firmly, and prevents destructive cracking. It reduces maintenance, because the road is better able to withstand heavy loads and lasts longer.

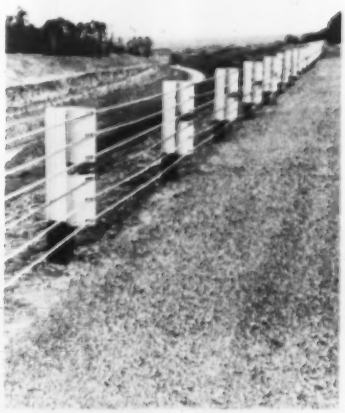


USS American Welded Wire Fabric

—THE OHIO TURNPIKE

maintenance accidents





Multisafty Cable Highway Guard makes this section of the famous Ohio Turnpike safer. The precipitous drop needed extraordinary protection. A special six-cable Multisafty Guard was designed to assure maximum protection. Elsewhere on the turnpike, four cables were used.

The longer reinforced slabs on the Ohio Turnpike provide a low cost, smooth riding surface. And specially designed American Road Joints were used to keep the slabs in proper alignment and to provide adequate load transfer for a balanced pavement design.

Expanded facilities for the manufacture of American Welded Wire Fabric now make it readily available in wire sizes up to and including ½" in diameter, at 2", 3", 4", and 6" on center. American Fabric increases the life of both Portland Cement Concrete and asphaltic concrete pavements. It meets ASTM Specification A 185-53T.

When it comes to safety, remember that USS Multisafty Cable Highway Guard protects in two ways: it restrains uncontrolled vehicles and it cushions the impact of collision between vehicle and guard.

Send this coupon for complete facts about American Steel & Wire products that can increase the safety and help reduce the long-term cost of your roads.

AMERICAN STEEL & WIRE DIVISION, UNITED STATES STEEL, GENERAL OFFICES: CLEVELAND, OHIO
COLUMBIA GENEVA STEEL DIVISION, SAN FRANCISCO, PACIFIC COAST DISTRIBUTORS
TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA., SOUTHERN DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

FREE TECHNICAL DATA

American Steel & Wire
Dept. 56-C, Rockefeller Bldg.
Cleveland 13, Ohio

Please send complete information on the following products:

- ☐ American Welded Wire Fabric for Portland Cement Concrete
- ☐ American Welded Wire Fabric for Asphaltic Concrete
- ☐ American Welded Wire Fabric for Airport Runways
- ☐ American Road Joints
- ☐ Multisafty Highway Cable Guard
- ☐ American Beam type Highway Guard
- ☐ American Wire and Strand for Prestressed Concrete

Name

Firm

Address

City State

USS Multisafty Highway Guard

USS

UNITED STATES STEEL

3 MORE GREAT "AMERICAN" ROADS

John Lodge Expressway strengthened with American Welded Wire Fabric

This outstanding urban thruway and its companion, the Edsel Ford Expressway, in Detroit, were reinforced with American Welded Wire Fabric for longer life, reduced maintenance.

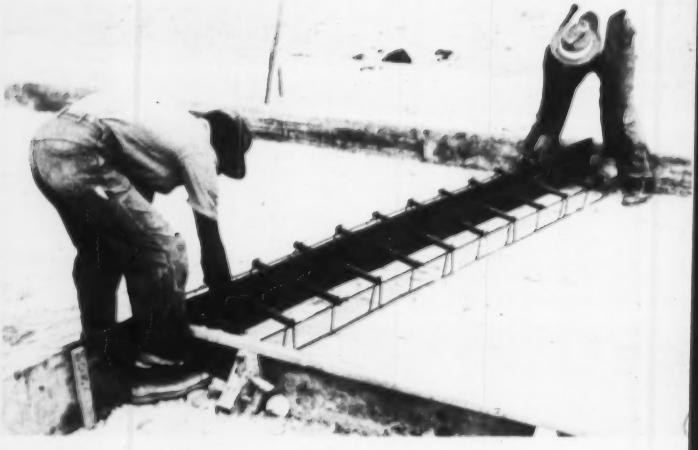
Maine Turnpike protected with American Highway Guard

On this particular section of the Maine Turnpike, highway engineers preferred a beam type guard and American Steel & Wire supplied it. On other sections of this important northeastern road, USS Multisafty Cable Highway Guard is being used.

Indiana Toll Road strengthened with American Road Joints

Scheduled for completion late this year, the new Indiana Turnpike is another important link in a growing network of East-West superhighways. American Welded Wire Fabric, together with adequately reinforced joints, provides maximum corner protection for this concrete pavement.

For complete information about Construction materials manufactured by American Steel & Wire, send the coupon on the previous page.



USS American Welded Wire Fabric
USS Multisafty Highway Guard

USS

UNITED STATES STEEL

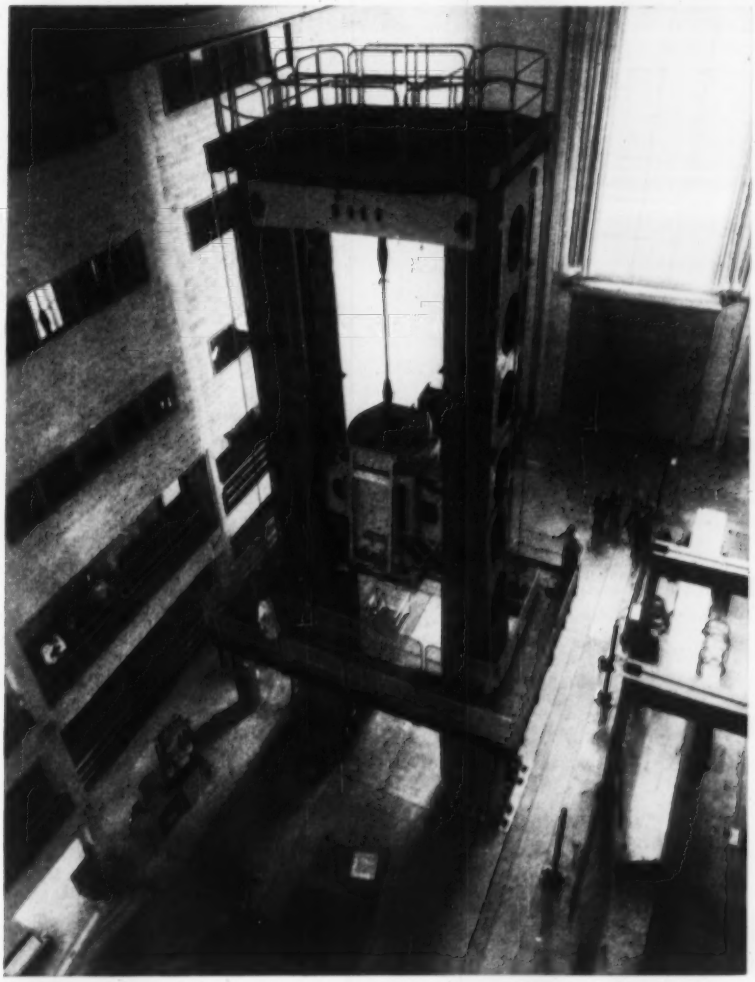
gage so located that accurate flow estimates can be made for the reach. By sampling and observing at each station about once a week during a summer and fall, some 20 sets of data will be available to yield an accurate prediction equation.

Constants in the basic equation are now evaluated by the method of multiple correlations. Means of the observed values of variables are computed. Then the sums of squared deviations from the mean values are computed for each sampling date, as are sums of cross products of deviations of all possible combinations of two variables. These sums are entered into simultaneous equations determined from standard least squares procedures and their solution provides values for the constants.

A prediction equation in usable form reads something like:

DO drop = $-1.665 + .480$ (BOD) $+ .208$ (Temp) $+ .044$ $(10{,}000/Q)$.

Any reasonable values (within the observed range) of BOD, temperature and discharge may be inserted in the equation and the resulting DO drop readily computed. To check on



Hangar Cable Gets the Big Stretch

Lehigh University's new 5,000,000 lb testing machine—said to be the world's largest—puts tension on a strand assembly for a new cable-suspended hangar roof. The assembly, consisting of a length of 2⅞-in. strand, sockets and 4-in. anchor rods, was tested to an ultimate strength of 784,000 lb. Tested separately, one of the 4-in.-dia alloy steel rods withstood 1,552,000 lb. To be used in the construction of TWA's new cantilever hangar at Philadelphia (ENR Jan. 26, p. 44), the cables required but a fraction of the giant testing machine's total strength (ENR Oct. 20, p. 93). For the new hangar, steel supplied by Bethlehem Steel Co. will be fabricated and erected by Lehigh Structural Steel Co.

Cut Material Wastes and Handling Costs

with a **MARIETTA** STORAGE SYSTEM Designed to your needs

Inefficient storage and handling of bulk materials runs costs up and production down. Let Marietta help you turn this cost factor into a profitable operation with a storage and handling installation engineered to the job.

Adaptable Marietta concrete silos will handle storage of any material from lump coal to core sand, chemicals, fly ash and etc. Their pre-cast solid or Air Cell concrete stave construction is sturdy . . . durable . . . fireproof. Moisture-resistant interiors eliminate costly waste or spoilage. Marietta storage silos are built with an extra strength factor for mounting any type of intake, discharge or materials handling equipment.

Whether you require 1 or 40 units . . . a complete new system or an addition to your present capacity . . . it will pay you to consult Marietta.

DON'T FIGHT SHORTAGES
Use Marietta concrete stave silos.

Write for informative booklet on how Marietta plans, engineers and erects modern storage-handling systems for industry.

THE Marietta 40 YEARS

CONCRETE CORPORATION
Marietta, Ohio

BRANCH OFFICES: Baltimore 21, Md., Charlotte 6, N.C., Nashville, Tenn., Jamestown, N.Y.

for HEAVY hauling

Truck powered by Waukesha WAKR (Butane).

WAUKESHA

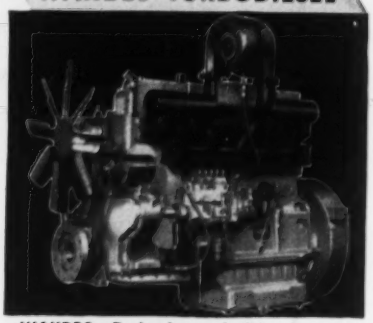
.....1197 CU. IN.....

Extra Heavy Duty ENGINES

all with counterbalanced crankshafts

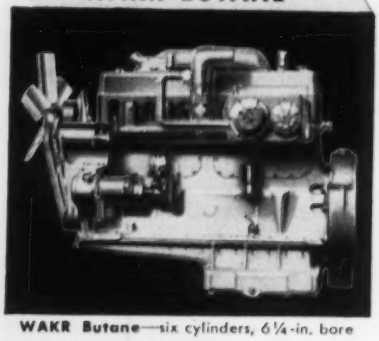
UP TO 352 max. hp

WAKDBS TURBODIESEL



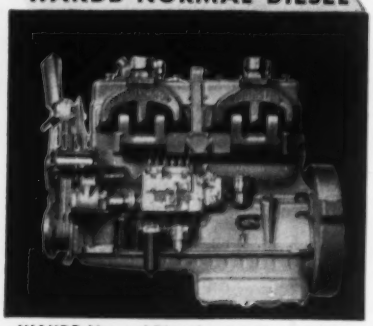
WAKDBS Turbocharged Diesel — six cylinders, 6¼-in. bore x 6½-in. stroke, 1197 cu. in. displacement, 352 hp at 1800 rpm.

WAKR BUTANE



WAKR Butane—six cylinders, 6¼-in. bore x 6½-in. stroke, 1197 cu. in. displacement, 290 hp at 1800 rpm.

WAKDB NORMAL DIESEL



WAKDB Normal Diesel—six cylinders, 6¼-in. bore x 6½-in. stroke, 1197 cu. in. displacement, 258 hp at 1800 rpm.

Send for descriptive bulletins

WAUKESHA MOTOR COMPANY, WAUKESHA, WISCONSIN
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50th ANNIVERSARY Waukesha MOTOR CO. 1906-1956

312

the accuracy of the formula, each observed set of data is inserted and the corresponding DO drop computed. A plot of observed versus computed DO values indicates the probable accuracy of the multiple correlation. If not satisfied, a stream evaluator can obtain more data and re-compute the constants.

Churchill has made three applications to date of his statistical procedure and obtained coefficients of multiple correlation in the range of 0.87 to 0.95. He adds that his method is suitable for use by small organizations as well as large ones, and that in many instances data already exists that can be analyzed to yield reliable estimates of stream capacity.

A more complete description of Churchill's work will be made available in an early issue of Sewage and Industrial Wastes.

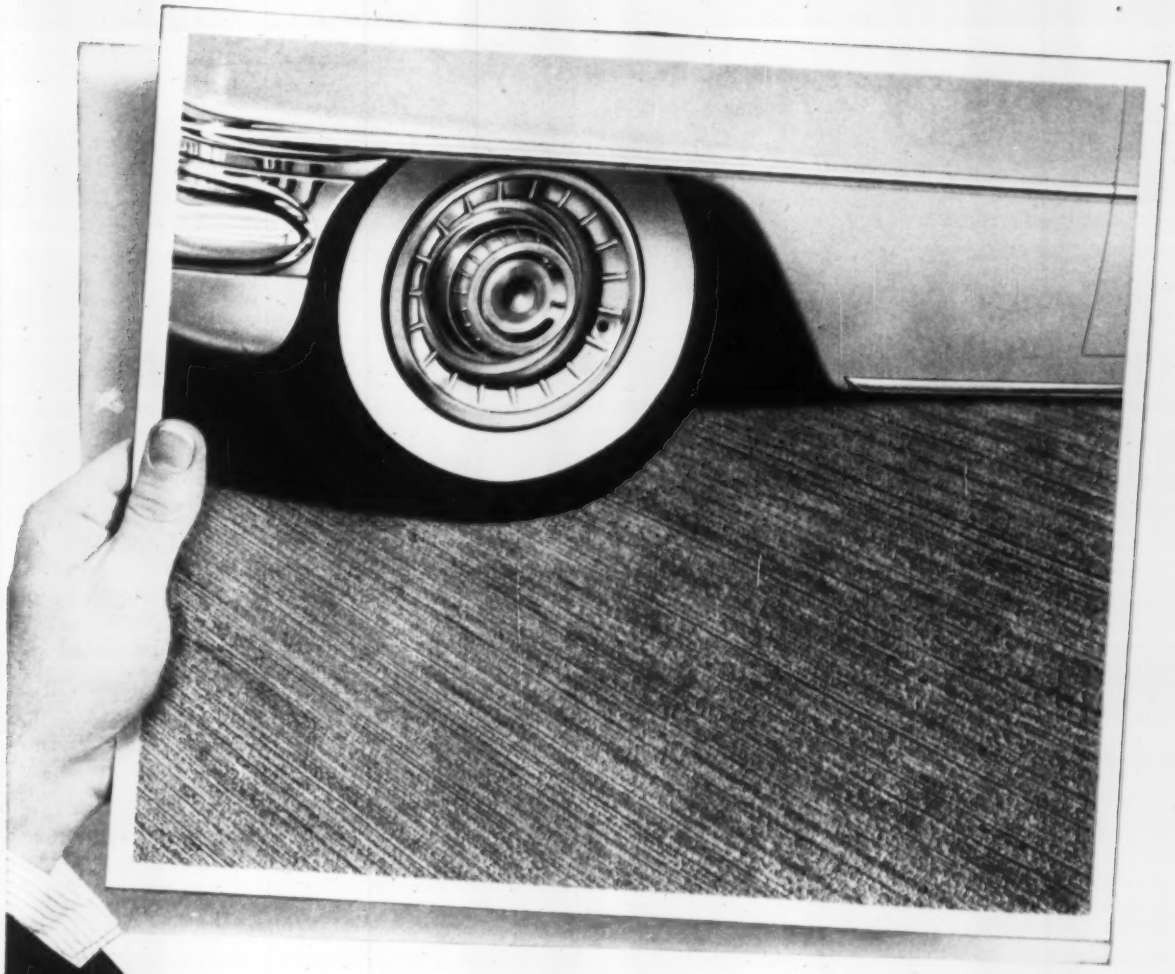
Improved Recording

Better vibration records possible with new meter

A new instrument to record vibration and shock measurements of structures promises several advantages over types presently in use. Specifically developed, by the National Bureau of Standards, for shock-damage tests aboard moving ships or planes, the new device could find use in vibration measurements of buildings and bridges.

The instrument is a barium-titanate velocity meter. Velocity meters have come into common use in recent years for vibration and shock measurements—manufacturers of aircraft and shipboard equipment make extensive use of them to determine the shock-performance characteristics of their products. Velocity records of vibrations and motion are preferred to acceleration records because peak velocity correlates better with damage.

Advantages of the new-type velocity meter are a sensitive axis that can be used at any angle without adjustment, a uniform velocity response down to 1 cps, and practically an unlimited displacement range. Its sensing element is a group of four barium-titanate piezoelectric transducers that are each 3 in. in dia, ¼ in. thick. This type of transducer can convert mechanical energy into electrical energy or vice versa. An applied acceleration of one gravity unit, g, will produce an electrical output of about 200 millivolts. Linear range of the instrument is ± 300 g.



Here's why motorists are Safer

WHEN THEY DRIVE ON CONCRETE

Experienced motorists know they are safer and under less tension when driving on a concrete road. There are two very good reasons:

BUILT-IN SKID RESISTANCE. Concrete pavement is finished with a gritty texture that gives tires a firm grip, lessens chances of deadly skids or loss of control—*especially in rain!* This safety feature endures because it is *built-in*. It lasts for the long life of a concrete road.

HIGH LIGHT REFLECTANCE. Nighttime driving on concrete is safer and more relaxed, too, because visibility is far better. Concrete's light color and grainy texture diffuse and reflect many times more light than other pavements do. Drivers can see farther and better during the hazardous hours between dusk and dawn.

Motorists and all other highway users look to engineers and public officials for safer roads. Drivers know that their driving safety often depends on good visibility and skid resistance.

Night or day, wet or dry, only concrete roads provide these important features, making them the safest roads you can build. Invest highway funds wisely. Give motorists maximum safety, lifetime durability and economy in the roads they buy. Pave all main roads with concrete.

PORTLAND CEMENT ASSOCIATION 33 West Grand Avenue, Chicago 10, Illinois

A national organization to improve and extend the uses of portland cement and concrete through scientific research and engineering field work.

STREAMLINE

YOUR LIQUID HANDLING

with DEMING Turbine Pumps

A wide variety of liquids are handled by Deming Vertical Turbine Pumps in diversified industries. Advantages over conventional pumps in comparable services include the following:

COMPACTNESS: A Deming Turbine with a 250 H.P. motor requires floor space only 3 feet square.

SIMPLIFIED PIPING: No suction piping required.

NO PRIMING PROBLEMS: Pumping element always submerged.

FLEXIBILITY OF DESIGN: Vertical multi-stage construction permits selection of correct number of stages for head and maximum efficiency.

LOW MAINTENANCE COST: Heavy duty, vertical construction eliminates side thrust. Centered discharge column permits accurate alignment.

All the facts on Deming Vertical Turbine Pumps are necessary to judge their advantages. Write:

THE DEMING COMPANY • 536 Broadway, Salem, Ohio

CALL YOUR DEMING DISTRIBUTOR for help on pumps!

Men and Jobs

Col. R. J. B. Page

Col. R. J. B. Page Appointed Seattle District Engineer

Col. R. J. B. Page, presently in charge of the Okinawa Engineer District, has been appointed district engineer for the Corps of Engineers at Seattle, Wash. He will succeed Col. N. A. Matthias, who will retire from active duty this summer after holding the Seattle post for four years.

Col. Page, a 1936 graduate of the U.S. Military Academy, was district engineer at Garrison, N. D., from 1951 to 1953, before being assigned to Korea to command an engineer construction group and then to Okinawa.

Col. Matthias has been with the Corps of Engineers since his graduation from West Point in 1926.

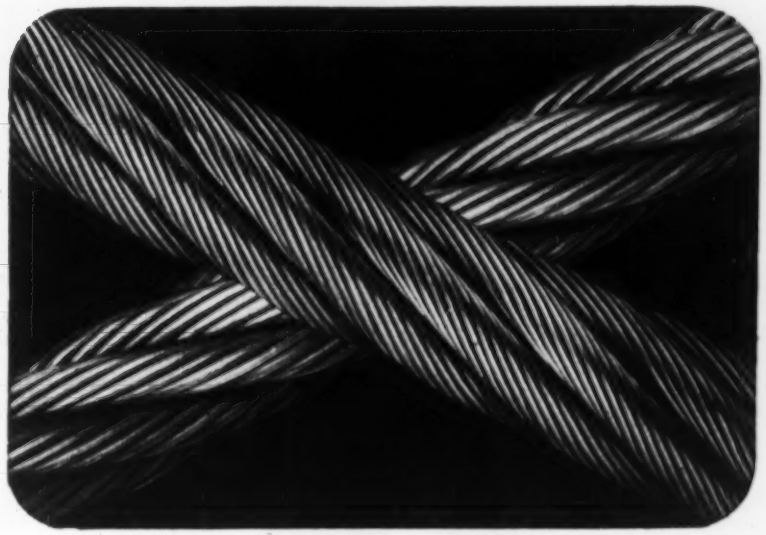
Chicago Appoints Downes As Director of Airports

William A. Downes, Jr., a career engineer in Chicago's Department of Public Works for nearly 30 years, has been named Director of Airports.

In this newly created position, Downes will have charge of operations and maintenance of the city's three airports. A civil engineering graduate of Armour Institute of Technology in 1926, he started as a rodman with the city, advancing through successive civil service positions to assistant engineer of waterworks construction in 1943. At the time of his appointment to the new post, he was assistant administrative engineer, Department of Public Works.

(*Men and Jobs continued on page 78*)

FIRST WE DEVELOPED 1105 ROPE WIRE.



THEN WE MADE ROEBLING'S

Royal Blue

WIRE 1105 ROPE

1105 takes Royal Blue out of the ordinary wire rope class.

1105 is a rope wire that's new—that's stronger. It's the biggest news in many years.

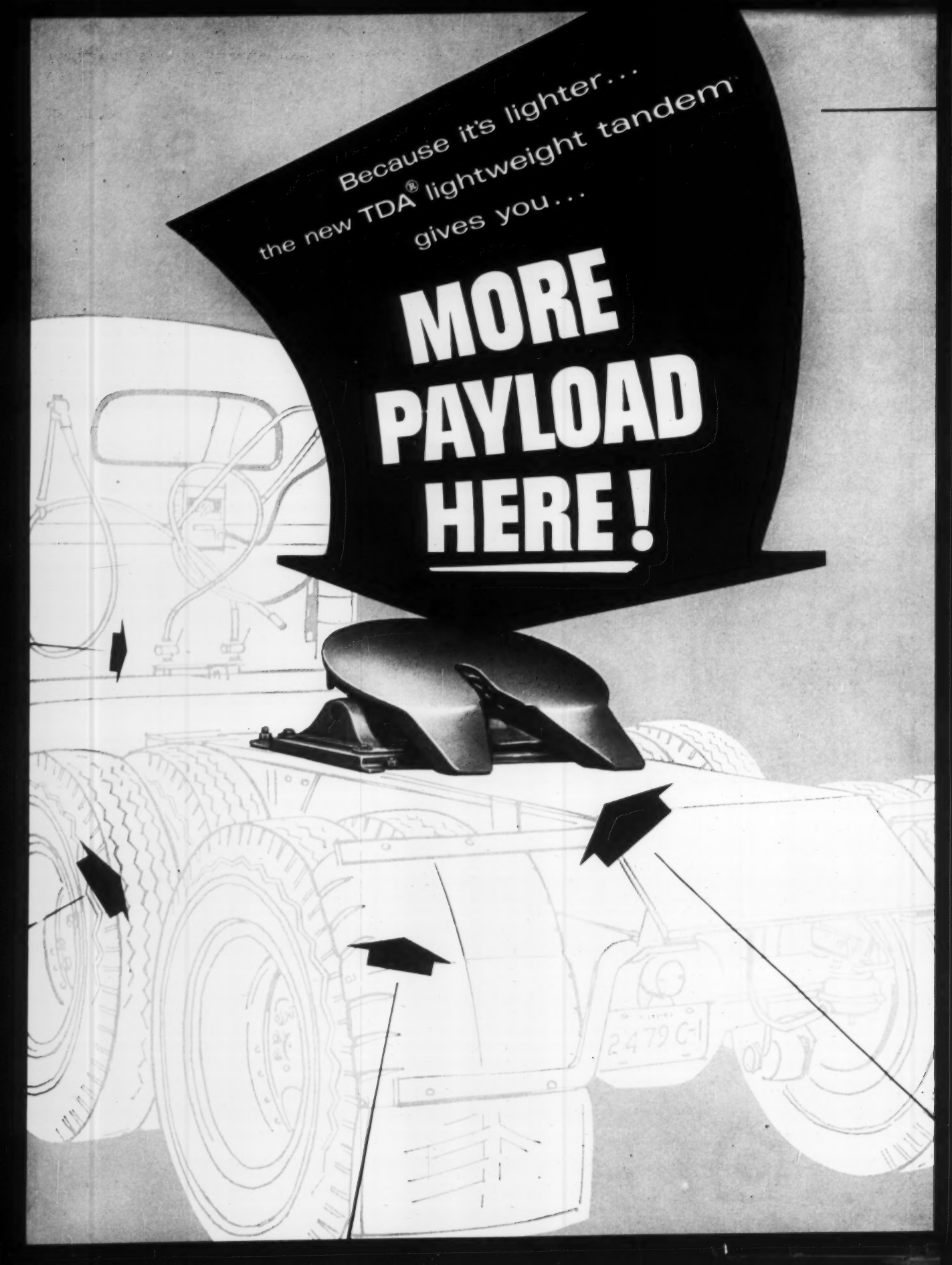
1105 is the result of more than a century of research and development—it's the wire that gives Roebling Royal Blue the stamina that pays off in service.

Contact your Roebling distributor or write us for the full story.

ROEBLING

Subsidiary of The Colorado Fuel and Iron Corporation

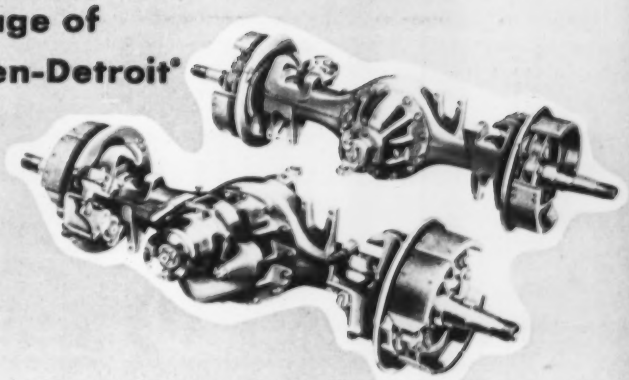
JOHN A. ROEBLING'S SONS CORPORATION, TRENTON 2, N. J. BRANCHES: ATLANTA, 934 AVON AVE. • BOSTON, 51 SLEEPER ST. • CHICAGO, 5525 W. ROOSEVELT RD. • CINCINNATI, 3253 FREDONIA AVE. • CLEVELAND, 13225 LAKEWOOD HEIGHTS BLVD. • DENVER, 4801 JACKSON ST. • DETROIT, 915 FISHER BLDG. • HOUSTON, 6216 NAVIGATION BLVD. • LOS ANGELES, 5340 E. HARBOR ST. • NEW YORK, 19 RECTOR ST. • ODESSA, TEXAS, 1930 E. 2ND ST. • PHILADELPHIA, 230 VINE ST. • SAN FRANCISCO, 1740 17TH ST. • SEATTLE, 900 1ST AVE. S. • TULSA, 221 N. CHEYENNE ST. • EXPORT SALES OFFICE, 19 RECTOR ST., NEW YORK 6, N. Y.


Because it's lighter...
the new TDA® lightweight tandem
gives you...
MORE
PAYLOAD
HERE!

this means...

8,500 EXTRA TON-MILES PAYLOAD A YEAR

...and it's built with a high percentage of parts interchangeable with Timken-Detroit® standard single axle components



There are important *payload bonuses* for truckers in TDA's new lightweight tandem. Over 230 pounds lighter than any unit of the same capacity, this new axle assembly gives operators more than 8500 extra ton-miles of payload during an average 75,000-mile trucking year.

Important *maintenance advantages* also are gained with this new tandem. Almost all of the wearing parts — gears, pinions, differentials, bearings and brakes — are identical with components from widely used TDA standard single axles. This means easier service, smaller parts inventory, and more time on the road.

Some Outstanding Features of this New Timken® Tandem

TDA Inter-Axle Differential divides torque evenly between axles . . . yet permits wheels of one axle to revolve faster or slower than wheels of the other axle. This means both axles are doing equal amounts of work . . . driving parts and tires last longer.

Driver-Controlled Lockout — with TDA Inter-Axle Differential, the driver can obtain the advantages of straight-through drive under slick or icy conditions by locking out the differential at any driving speed.

Big, Dependable Hypoid Gears rotate in conventional direction for maximum gear and bearing life.

Optional Axle Connecting Groups. This new tandem is available with either TDA famous "Cradle Ride" axle connecting parts, or brackets to accept other approved chassis hook-ups.

This new tandem insures new payload profits, faster, easier service and operating economies for operators everywhere. For complete information contact your nearest vehicle dealer or branch.

TIMKEN Detroit AXLES
TIMKEN-DETROIT AXLE DIVISION
ROCKWELL SPRING AND AXLE COMPANY
DETROIT 32, MICHIGAN
The Accepted TDA Standard
TRADE MARK REGISTERED

WORLD'S LARGEST MANUFACTURER OF AXLES FOR TRUCKS, BUSES AND TRAILERS

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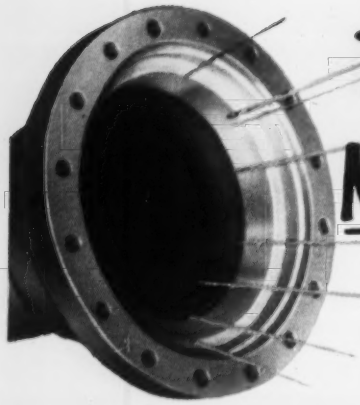
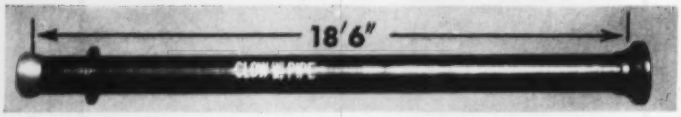


RIVERS? Nothing to 'em!

with

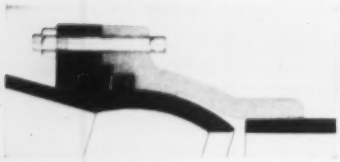
CLOW CAST IRON
Ball-and-Socket
RIVER-CROSSING PIPE

Faster, Simpler Installation



Longer laying lengths, fewer joints. Shorter lengths to exact dimension.

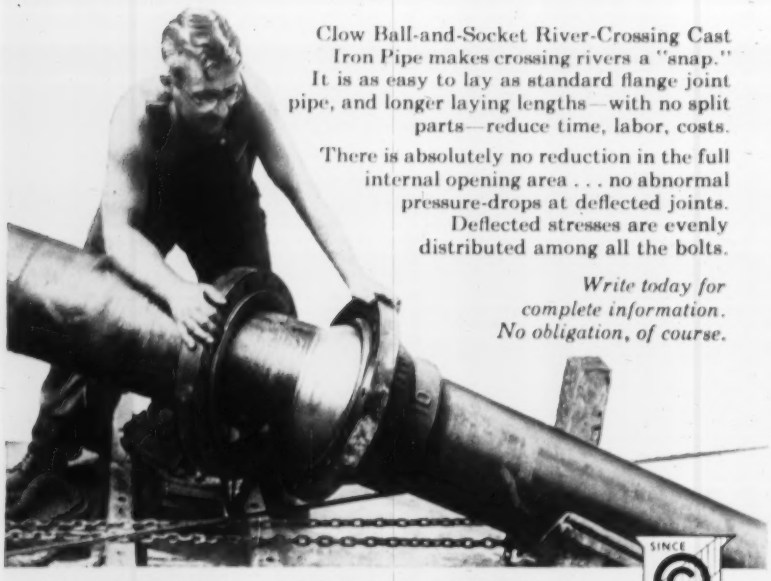
Full Flow at Full Deflection



Full 15° turning deflection. No restriction of the waterway.

Fewer Parts No Split Parts

Needs only a ratchet wrench for fast, firm assembly.



Clow Ball-and-Socket River-Crossing Cast Iron Pipe makes crossing rivers a "snap." It is as easy to lay as standard flange joint pipe, and longer laying lengths—with no split parts—reduce time, labor, costs.

There is absolutely no reduction in the full internal opening area . . . no abnormal pressure-drops at deflected joints. Deflected stresses are evenly distributed among all the bolts.

Write today for complete information. No obligation, of course.

JAMES B. CLOW & SONS Inc.
201-299 North Talman Ave. • Chicago 80, Illinois

Subsidiaries: Eddy Valve Company, Waterford, New York • Iowa Valve Company, Oskaloosa, Iowa

. . . Men and Jobs

Chamber Of Commerce Gives Steiner Construction Post

James F. Steiner has been appointed manager of the Construction and Civic Development Department of the Chamber of Commerce of the United States. He succeeds F. Stuart Fitzpatrick, who headed the department from 1928 until his recent death (ENR Mar. 8, p. 25).

Steiner has been assistant manager and urban development specialist in the department since 1953, following three years of service as program adviser to the western division of the Chamber of Commerce.

Veteran Project Engineer Assigned to Coyote Dam

Charles F. Beatie, project engineer at the recently completed Folsom Dam, has been assigned by the Corps of Engineers to direct construction for Coyote Dam on the Russian River, near Ukiah, Calif.

Beatie, an Oregon State graduate of 1922, has worked on a number of dam projects, including Pine Flat and Bonneville.

Men and Jobs Briefs . . .

• **Associations**—The American Institute of Timber Construction elects **George E. Schweitzer** of Rilco Laminated Products, Inc., St. Paul, Minn., as president . . . **D. C. Greer,** Texas State Highway Engineer, is named president of the Western Association of State Highway Officials.

• **Corps of Engineers**—In July, **Col. Oliver J. Pickard,** now vice-commander, 7th Engineer Aviation Brigade, U. S. Air Force, Europe, will become District Engineer for the Corps of Engineers at Norfolk, Va. He will succeed **Col. Robert B. Warren,** who will attend the National War College, Washington, D. C. . . . **Charles H. Wagner,** chief of the construction division for the Seattle District, is appointed resident engineer for the New Cumberland lock and dam on the Ohio River, Pittsburgh District.

• **Careers**—The New York State Department of Public Works appoints **Robert W. Sweet,** formerly district engineer at Watertown, as acting deputy chief engineer of the department . . . **Jack B. Baines** is named assistant chief engineer of the Port of Oakland, Calif. . . . **William E. Edens** of Trenton, N. J., who has been an

engineer with the New Jersey Division of Water Policy and Supply, is appointed city engineer and director of public works at Reidsville, N. C.

• **Business**—The Illinois Central Railroad names **John M. Trissal** of Flossmoor, Ill., as chief engineer of the company . . . Boswell Engineering Company, consulting engineers in Ridgefield Park, N. J., announces the association of **Edward W. Kilpatrick,** former New Jersey state highway engineer, with the firm . . . **Frank E. McClure,** formerly with the Oakland Board of Education, establishes his own practice as a consulting structural engineer with offices in Oakland, Calif.

• **Honors**—The Metropolitan Section of ASCE names **Jacob Feld,** New York City consulting engineer, "Metropolitan Civil Engineer of the Year 1955" for his structural design of the New York Coliseum . . . New York architect, **Antonin Raymond,** is awarded the 1956 Medal of Honor of the New York Chapter of the American Institute of Architects.

Obituaries

Thomas R. Simpson, 60, consulting engineer and an authority on water resources in California, died April 19. A civil engineering graduate of the University of California in 1920, he had served with the State Division of Water Resources and its predecessors for over 20 years, leaving in 1950 as Principal Hydraulic Engineer in charge of statewide water investigation. He then was appointed Professor of Irrigation Engineering at the University of California in Berkeley. Prior to that time he served as consultant to the Joint Committee on Water Problems of the California Legislature, and to several water control organizations in the state.

Lester V. Branch, 76, retired civil engineer who had been in charge of engineering design work for the San Francisco Metropolitan Water District aqueduct, died recently. He joined MWD in 1933 and served as office engineer in charge of the Colorado River project until 1939. Prior to that time he supervised engineering work on other hydroelectric projects, including Mitchell Dam and powerplant, and held the position of resident manager in charge of construction in Vermont of Connecticut River plants. He was one of the first civil engineers employed by the Bureau of Reclamation, which he joined in 1902, leaving 20 years later.

(Obituaries continued on page 80)

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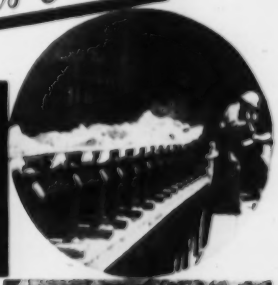

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"SUPER TRIPLE-S" Goodall's finest Conveyor Belting . . . for super-severe service. Built to handle crushed stone up to 10" and other highly abrasive bulk materials, wet or dry, particularly on long center hauls where tension is high and extreme flexibility is required. Weather-resistant cover. Tensile strength, friction and other details determined by specific requirements.

"TRIPLE-S" Designed for severe service but where weight of bulk material and length of carry do not demand "Super-S" quality. Recommended for crushed stone up to 6" or 8", abrasive ores, etc.

"LACROSSE" A perfectly balanced, quality belt for all but the most severe conditions. Used for handling sand, gravel, shells, ashes, etc.

MUCKER BELTS

"Wear King" Brand. Developed especially for use on Conway Mucking Shovels in tunnel excavating, and employed on most of the largest modern tunnel jobs.

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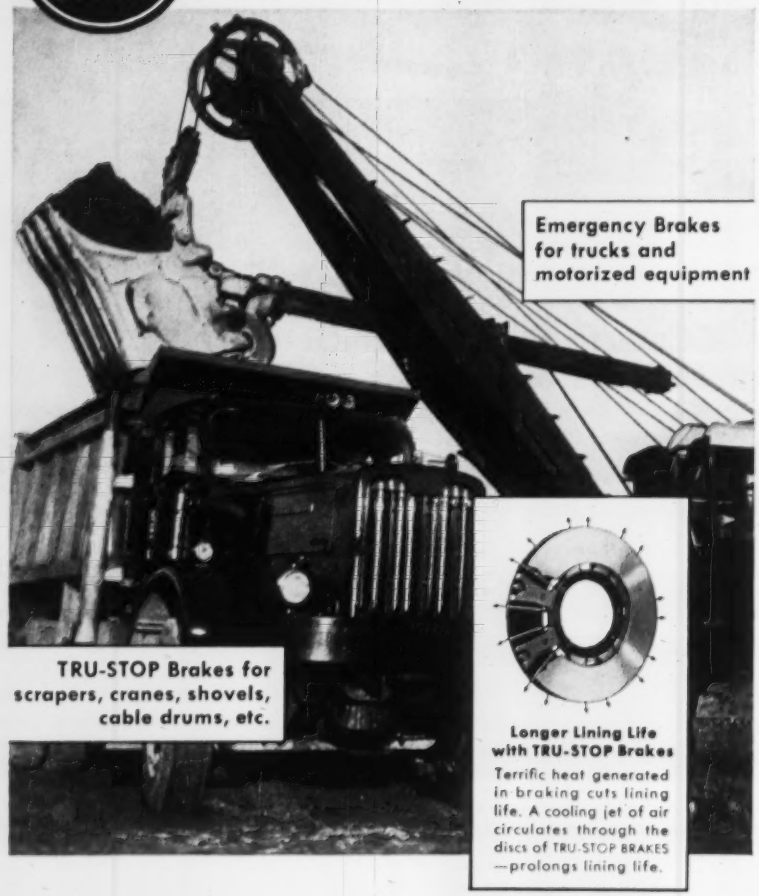
Be Sure You Can STOP!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Terrific heat generated in braking cuts lining life. A cooling jet of air circulates through the discs of TRU-STOP BRAKES —prolongs lining life.

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• TRU-STOP BRAKES are the outstanding choice for emergency brakes on heavy-duty trucks and tractors. The controlled and uniform braking pressure brings the vehicle to a quick, positive stop under the most extreme conditions.

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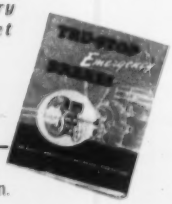

ACCO

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. . . Obituaries

DeMarcus D. Forgey, 69, former Seattle district engineer for the Washington State Highway Department, died April 6. A civil engineering graduate of Washington State College in 1909, he worked for railways in Canada and in pre-construction work on Seattle City Light's Ross Dam before joining the highway department in 1925. He retired March 1, after having been Seattle district engineer since 1951.

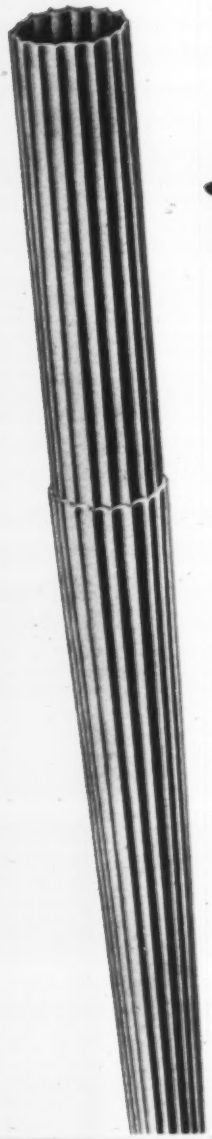
J. Roy Tillman, 63, Spokane district engineer for the Washington State Highway Department since 1946, died April 4. Mr. Tillman joined the department in 1919 and became assistant engineer at Wenatchee in 1929. In 1934, he was named district engineer at Olympia as well as state aid engineer.

Leon Fleischmann, 77, civil engineer and former president of the Ninth Federal Savings and Loan Association, died April 16 in New York City. He had been regarded as an expert on structural standards and assisted in the formulation of municipal building codes for the city. He had also served as a consultant in several other cities. Mr. Fleischmann received his civil engineering degree in 1923 from New York University.

Russel Smith, 58, public health engineer at the Robert A. Taft Sanitary Engineering Center in Cincinnati since 1934, died recently. A graduate of the Massachusetts Institute of Technology, he was in field service at Frankfort, Ky., during the 1937 flood, and had been a pioneer in water purification studies in Cincinnati.

John W. Dutton, 80, retired civil engineer for the California State Division of Architecture, died April 11. Since retirement, he had served as chief construction engineer for Harry J. Devine, architect. Mr. Dutton was an engineer with the State Division of Architecture from 1908 until his retirement in 1945 when he was chief of the construction service area.

Clair E. Smith, 51, deputy chief engineer in the New York State Department of Public Works since 1954, died April 15. In 1932, nine years after entering state service, he was named assistant civil engineer in charge of highways. Since 1951 he had been with the department's main office in Albany as associate civil engineer, and this year became principal civil engineer in charge of plans and design.



Monotube Foundation Piles...

BEST START

for saving time — money — materials

IN today's highly competitive construction business, it's mighty important to invest time, money and materials as wisely as possible. That's why you'll want to learn more about *the best start* when building . . . tapered, fluted steel Monotube foundation piles.

Illustrated on this page are several examples of field work involving Monotube piles. With a fast, single girt weld of telescopic joints, Monotubes can be extended to any required length. Cut-offs are easy too . . . and no waste, as these same cut-offs can be re-used to extend other piles. Light-weight construction plus cold-rolled strength means easier handling and faster pile installation. Tubular design makes inspection before concreting quick and sure.

Mentioned above are only a few of the reasons why more and more foundation jobs are getting off to a good start using Monotube piles. To get *all* the facts, write The Union Metal Manufacturing Company, Canton 5, Ohio. Request Catalog No. 81.

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Monotube Foundation Piles

PROLONGED CONFINEMENT COUNTS

...when it comes to best breakage

Contractor needs good breakage and control on this road grading shot. Job calls for careful attention to loading and spacing... and ROCKMASTER method of bottom initiation to prolong confinement of blast.

105 holes . . . 10 ft. spacing. Each hole loaded with a ROCKMASTER electric blasting cap and 40 lbs. of Atlas 40% Extra Dynamite. At height of blast, note fine fracture and control.

Prolonged confinement pays off! No wild flying boulders. Basalt rock just "heaved" up and broken. Excellent fragmentation. Contractor has well placed pile, bite size, ready for removal.

PROLONGED CONFINEMENT—the Rockmaster® way

There's nothing like a combination of Atlas 40% Extra Dynamite and a ROCKMASTER pattern . . . when it comes to economical, controlled blasting. A medium velocity ammonia dynamite, with properly chosen millisecond delays it gives good heaving, stressing action, allowing maximum breakage and control.

On this road grading job at Roseburg, Ore., D & H Construction Co. and M. H. Hassler, contractors, gained *prolonged confinement* by keeping explosives force working *underneath* the burden . . . lifting it . . . breaking it up thoroughly. The right combination of ROCKMASTER millisecond delay electric blasting caps and Atlas explosives produced—

- **good control**
- **improved breakage**
- **greater efficiency**
- **better public relations**

Before your next blast, why not go over your specific problems with your Atlas representative? He'll help you get the most out of the ROCKMASTER method, your caps, and your explosives. And get "Better Blasting"—Atlas' informative newsletter on latest methods and materials. Write us to put your name on our mailing list today.

EXPLOSIVES DEPARTMENT

ATLAS POWDER COMPANY

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Priest Rapids Contract Pending Award

The $91,880,625 low bid on Priest Rapids dam and 630,800-kw powerhouse on Columbia River near Richland, Washington, awaits contract award since March 12, 1956. This contract will be part of the overall $360 million project upstream of McNary Dam with a total capacity of 1,200,000 kw. Harza Engineering Co., of Chicago, Ill., is consulting engineer for the owner, Grant County Public Utility District, Ephrata, Wash.

The complete table of prices reported here includes, in addition to the dam and electrical constructions, unit prices on the powerhouse, including wall paneling, acoustic ceiling, flooring, doors and windows.

The low bid sets two records. It is the largest to be based on competitive bidding and the largest to be placed by a single company, Merritt-Chapman & Scott Corporation, New York. Their bid is 1.4% below the second low bid and 26.5% under the engineers estimate (ENR March 22, 1956, p. 21). The other four bidders were joint ventures. Second low was Henry J. Kaiser Company in combination with these seven firms: Ralph E. Mills Co., Inc.; Hawaiian Dredging Co., Ltd.; Blythe Bros. Co.; B. Perini & Son, Inc.; Raymond Concrete Pile Co.; Walsh Construction Co.; and J. H. Pomeroy & Co., Inc. High bidder was JTM Constructors in a joint venture of J. A. Jones Construction Co.; Charles H. Tompkins Co.; S. J. Groves & Sons Co.; W. K. McIlvar Construction Co.; D. W. Winkelman Co., Inc.; McDevitt & Street Co.; and Thompson & Street Co. Their bid was still 12.8% below the estimate.

Work under this contract will include the diversion of Columbia River with care of water, the construction of the reinforced concrete and earthfill dam and the powerhouse with all equipment. The dam with spillway and fish passing facilities will be 8,000 ft long, 175 ft high and will have a maximum head of 79 ft.

Included in the powerhouse equipment are eight 78,850-kw generating units. All bids are based on purchasing turbines and governors from Kaplan in England. American manufacturers are protesting possible purchase of foreign equipment under this contract. See p. 8.

The contract price will also cover subsurface exploration for the site of Wanapum Dam, a separate unit of the overall project.

Specifications require that the proportioning of materials in the concrete follow in general AIC Standard Recommended Practice for the Design of Concrete Mixes 613-44 or Proposed Recommended Practice for Selecting Proportions for Concrete 613-53. Concrete mixes range from 2.5 to 6.5 bags of cement per cu yd. Cast iron pipe has to qualify under ASTM standard A 377.

Work must be completed within 1,900 calendar days. But to make an earlier completion attractive, PUD will pay a $1,300 bonus per day per generating unit. The liquidated damages will be $3,000 per day per unit.

General laborers will be paid $2.27 per hour, power equipment operators $2.40 to $3.10, cement masons $2.75, iron workers $2.87 to $3.07, carpenters $2.90 to $3.15, electricians $3.02 and tile setters $3.26.

1	Merritt-Chapman & Scott Corp, New York	$91,880,625
2	Henry J. Kaiser Co. & Assoc, Oakland	93,160,204*
5	J. T. M. Constructors, Charlotte, N. Car	108,889,163*
EE	Harza Engineering Co, Chicago, Ill	125,000,000

* Includes 75% of proposed price escalation to cover possible increases in material and labor

Bids: 3 12 56 Items	Unit	Quantity	Unit Prices 1	2
Construction				
Access road	ls	job	$450,000	$207,000
Office facilities	ls	job	50,000	45,000
Labs, field insp offices & rock core shed	ls	job	60,000	53,500
River equip, special	ls	job	8,000	9,380
Hole set-up, river	ea	12	600 00	750 00
land	ea	22	200 00	225 00
drill, river	lf	1,000	20 00	19 10
land	lf	3,000	12 00	16 11
sp sample	lf	200	25 00	30 70
Pipe observation well	lf	2,000	2 00	2 55
Casing, 4"	lf	180	6 00	4 10
Drill holes, sample & test, crew hour		200	17 00	22 50
Core boxes	ea	250	10 00	11 08
Test pit, excav	cy	200	100 00	9 35
samples	ea	25	25 00	13 40
Pump, test	hp hr	2,500	0 60	0 35
Water, divert & care of	ls	job	8,048,744	7,500,000
Excav, embkt, left	cy	1,350M	2 00	0 64
right	cy	352,000	1 50	0 64
spillway	cy	320,000	3 50	3 28
power house	cy	787,000	4 00	3 16
tailrace	cy	450,000	3 00	2 76
Line drill & broach	sf	150,000	1 25	2 77
Rock fndn, prep	sy	115,000	3 00	4 93
Set-up over grout, check or drain holes	ea	2,500	4 00	7 00
Holes, drill, AX	lf	71,000	3 00	2 50
BX	lf	7,000	4 50	4 00
NX	lf	26,000	6 00	6 00
Core recovery	lf	5,000	1 00	1 50
Connect to grout holes	ea	2,000	3 00	9 20
Anchor bar holes, drill	lf	20,000	1 50	0 80
Fndn grt, process, mix & place cmt	cf	75,000	3 00	2 45
Sand in grt	cy	500	50 00	38 00
Filt, imperv, right embkt	cy	140,000	0 75	1 13
left embkt	cy	510,000	1 20	1 56
perv, right embkt	cy	400,000	0 50	0 28
left embkt	cy	1,750M	0 50	0 64
Blanket, imperv	cy	105,000	1 20	1 56
Fill, trans, right embkt	cy	80,000	1 30	1 13
left embkt	cy	225,000	1 50	1 56
Compact, addnl, pass per 1,000	sy	5,000	1 00	5 68
Filter	cy	23,000	1 50	1 06
Riprap	cy	78,000	1 50	1 61
Blanket, gravel	cy	41,000	1 50	0 86
Base course	cy	4,800	3 00	1 09
Surface course	cy	1,650	5 00	18 30
Cmt, bit	t	300	15 00	38 65

Bids: 3 12 56 Items	Unit	Quantity	Unit Prices 1	2
Conc, spillway	cy	262,000	11 50	9 68
powerhouse	cy	430,000	11 50	13 98
gravity dam, left abtmt retaining & similar walls	cy	119,000	12 00	11 46
fish pass facltys	cy	38,000	15 00	16 20
misc	cy	500	40 00	12 30
Portland cement	bbl	757,000	5 50	5 115
Pozzolans	t	43,000	15 00	17 50
Forms, straight	sf	3,730M	1 00	2 10
curved	sf	427,000	3 00	4 20
Stl reinf & anchor bars	lb	60,000M	0 12	0 124
Wire fabric	lb	4+,000	0 20	0 19
Compnd, joint seal & calk	lb	2,500	1 00	1 37
Coat for breaking bond	sf	435,000	0 05	0 16
Preformed expans joint filler, bit type	lb	1,090	0 50	1 35
cork board	lb	6,000	1 50	2 18
Waterstop, type A	lf	7,000	1 75	4 05
type B	lf	200	2 00	4 21
type C	lf	59,100	1 25	2 94
type D	lf	19,400	2 25	4 72
Filler, bit cmt	cy	100	100 00	74 00
Struct steel	lb	1,150M	0 20	0 22
Track rail & acces	lb	836,000	0 15	0 21
Sheet met, galv	lb	70,000	0 50	0 37
CI frame, cov & grating	lb	14,500	0 40	0 31
Log boom & gd rail cable & fittings	lb	50,000	0 50	0 35
Metalwork, misc	lb	1,050M	0 40	0 73
for fish pass facltys	lb	1,250M	0 30	0 085
Float logs for trashboom	fbm	30,000	0 20	0 25
Timb, trshbm & skelet	fbm	165,000	0 20	0 27
Guard rail	fbm	60,000	0 20	0 27
Block wall, conc, 4"	sf	8,500	1 50	1 67
8"	sf	1,700	2 00	1 67
Glazed tile, struct, 4"	sf	900	1 25	3 67
6"	sf	600	1 50	4 35
soaps	sf	1,100	1 00	4 35
Paneling, wood	sf	7,600	1 00	0 67
Plaster board	sf	4,200	0 20	0 14
Insulation, alum foil	sf	1,000	0 25	0 25
Flooring, wood block	sf	1,500	1 00	2 51
Lumber & woodwork	fbm	21,000	0 50	0 37
Doors & fram, hollow met	sf	1,100	5 00	12 00
Doors, fire, met clad	sf	400	3 00	16 00
sliding	sf	290	6 00	13 30
vertical lift	sf	210	200 00	66 60
Dutch	ea	1	200 00	280 00
wood	sf	230	4 00	3 30
alum	sf	170	20 00	27 60
Hardware	ls	job	5,500	1,470
Floor, rubber tile	sf	4,650	0 70	0 94
quarry tile	sf	24,100	1 50	2 34
Base, rubber tile, 6"	lf	850	0 50	0 94
quarry tile, 6"	lf	950	0 80	1 30
Windows incl glazing	sf	220	8 00	10 70
Mirrors & glass shelves	ea	14	14 00	113 00
Roof	sf	81,600	1 50	2 43
scuttle	ls	job	500 00	400 00
Ceiling, acoustic	sf	4,800	1 75	0 94
AC board for ceiling	sf	900	0 50	2 34
for walls	sf	3,000	0 50	1 13
Deck insulation	sf	50,000	0 50	0 60
Shelves, steel	ls	job	100 00	100 00
Lockers, met	ls	job	1,500	1,480
Benches	ls	job	250 00	225 00
Signs	lb	400	2 00	2 66
Flag pole	ls	job	800 00	1,395
Toilet stalls	ls	job	1,000	1,970
Tile staff gages	sf	150	3 00	20 00
CIP, soil, bell & spigot extra heavy	lb	10,000	0 45	0 35
mech joint	lb	181,000	0 40	0 37
bell, spigot & flanged joint	lb	9,000	0 45	0 35
Pipe, stl, black or galv under 4"	lb	67,000	0 50	0 64
4-12"	lb	408,500	0 45	0 43
black, 12" +	lb	730,000	0 40	0 36
CMP	lb	155,000	0 40	0 34
Hose, flexible stl	lb	50	8 00	1 30
Pipe, acid resist	lb	2,500	1 00	1 47
brass, std IPS	lb	500	4 00	1 85
ash	lb	100	3 00	0 47
Tube, copper, hard or soft, seamless, type K & L	lb	10,300	2 80	1 98
Drain, floor, roof & gutt	lb	2,000	1 50	0 45
Valv, CI, flanged, 6"	lb	3,600	1 20	1 13
over 6"	lb	95,000	0 50	0 82
stl, flanged, 6" +	lb	1,900	1 50	1 01
semi-stl, flngd, 6"	lb	150	3 00	1 10
over 6"	lb	18,000	1 00	1 37
plug, flanged, 6"	lb	1,400	1 50	1 33
over 6"	lb	112,000	0 80	0 82
brass or bronze, screw or flanged	lb	2,000	2 50	3 19
solder joint	lb	250	2 00	3 20
Floor stands, valv ext stems & adj gd brkts	lb	13,500	1 70	1 68
Pipe hangers & supprts	lb	20,000	1 00	0 96
Tanks, stl	lb	30,000	0 25	0 27
Plumbing fixtures	ls	job	13,000	12,290

Continued on following page

Here are important facts for the "man behind the gun"

This White 18" Dumpy level has ...more of the features you want, yet costs you less!

Before you buy, compare this White Dumpy level with a similar model of any other recognized make. From every standpoint — design detail . . . quality construction . . . work-speeding, life-lengthening features and cost — you'll quickly see why a White's the best buy you can make. It will make your work faster, easier, more accurate. Check this comparison chart:

FEATURES	D. White No. 7080	Instrument A	Instrument B
Magnifying power of telescope	35X	30X	27X
Distance away you can read 1/100 ft. graduation	1200 ft.	1050 ft.	900 ft.
Diameter of objective lens	1.81 in.	1.485 in.	1.69 in.
Field of view (in minutes of arc)	64'	52'	60'
Coated optics	YES	YES	YES
Covered leveling screws	YES	YES	YES
Can you easily replace worn leveling screws in the field?	YES	NO	YES
Sensitivity of level vial (in seconds of arc per 2mm of graduation)	20"	20"	25"
Price — complete with carrying case, tripod and accessories — F.O.B. factory	$315.00*	higher	higher

For complete details on the 18-in. Dumpy level and other equally fine engineering instruments, see your David White dealer, or write direct to David White Co., 517 W. Court Street, Milwaukee 12, Wisconsin.

DAVID WHITE COMPANY

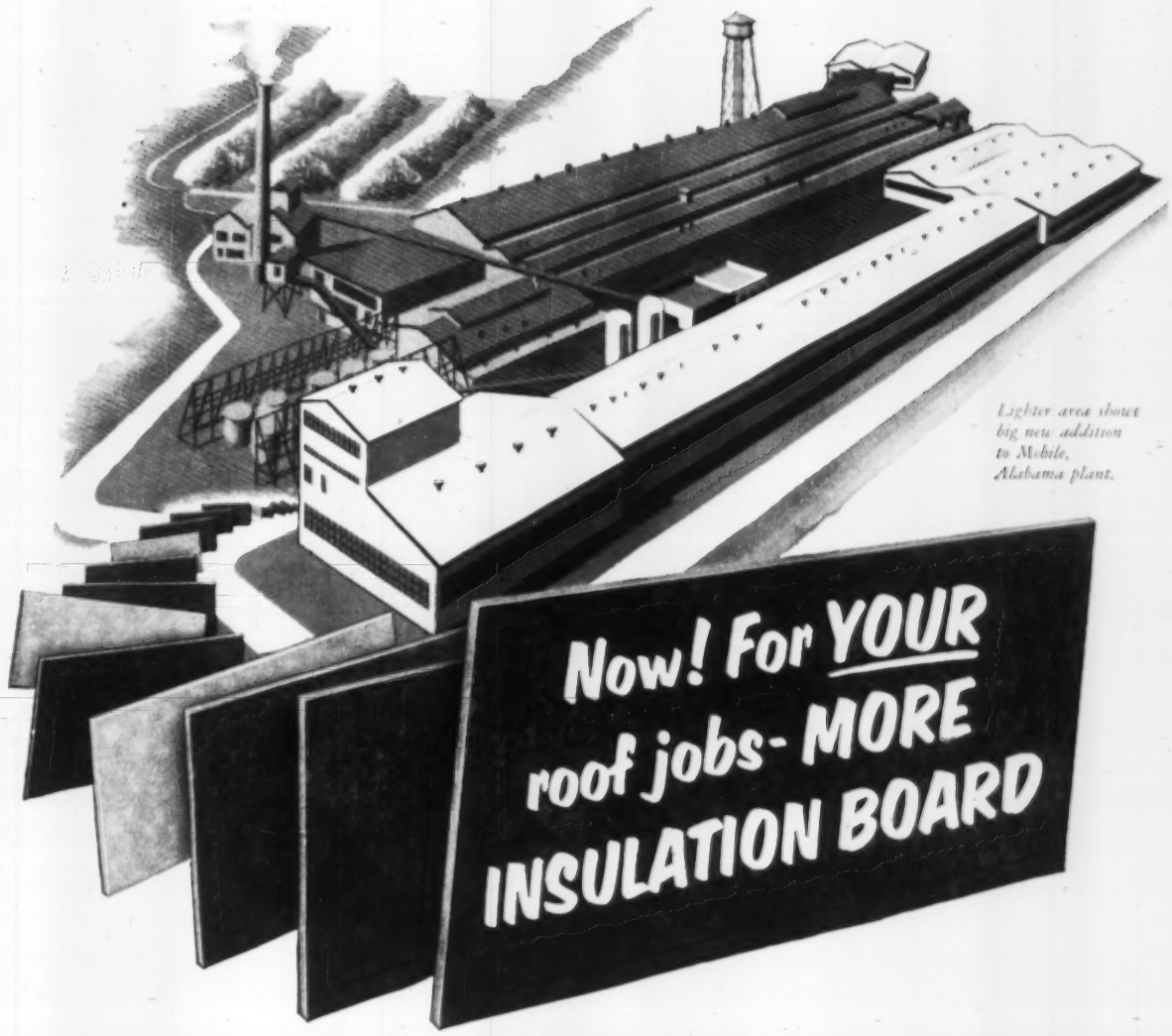
We offer complete, expert repair service on all makes, all types of instruments.

**Price subject to change without notice.*

Continued from preceding page

Bids 3-12-56 Items	Unit	Quantity	Unit 1	Prices 2
Air compressr, 100 psi & access	ls	job	15,000	23,500
350 psi	ls	job	4,000	9,200
Water treat plant	ls	job	10,000	11,000
Fire prot syst, generatr	ls	job	40,000	56,400
oil stor & purif room	ls	job	10,000	16,882
transformer	ls	job	78,000	79,000
equip, portbl & hung	ls	job	5,000	5,820
Oil purif equip	ls	job	12,000	14,630
Strainer, twin-basket	lb	39,000	1.10	1.26
Y-pattern	lb	50	8.00	2.54
Valv, pressure reduc, solenoid, misc, gage glasses & pr gages	lb	200	10.00	7.43
Transm, head & tail-water & indicator, remote	ls	job	6,000	24,700
Exp joints	lb	2,400	5.00	0.97
Sleeve couplings	lb	10,000	1.00	0.81
MH fram & cov, gas tight	lb	300	1.00	0.56
Inlet strainers	lb	25	20.00	1.20
Air traps, automatic	lb	150	4.00	1.58
Temperature detectors	ea	13	250.00	104.00
Flow meters & recorde	ls	job	31,000	25,170
Totalizing meter	ls	job	5,00 00	500.00
Duct, turn valv & splitter, butterfly & fire dampers	lb	71,000	1.95	1.68
Grill & register, gross area 1 sf	lb	850	4.00	1.80
ov r 1 sf	lb	2,700	2.50	1.69
Diffusers, high velocity	lb	600	9.00	3.40
low velocity	sf	400	13.00	10.00
Duct insulation	sf	3,900	1.80	1.67
Elevators	ls	job	70,000	106,700
Diesel generator, standby unit	ls	job	43,000	53,400
Pumps & acces, deep well turbine type	lb	60,000	0.16	0.40
centrif, wtr & sewer	lb	3,000	0.60	0.46
ax flow, fix blade	lb	475,000	0.35	0.235
positiv displcmt rotary or screw type	lb	300	1.10	0.64
Septic tank chlorintr	ls	job	1,000	370.00
Mach shop equip & crane	lb	24,000	0.06	0.279
Draft tube gantry crane, erect	lb	170,000	0.06	0.09
Pumphse crane, erect	lb	160,000	0.06	0.09
Fans, blowers, exhst, grav vent & acces	lb	19,000	0.25	0.28
Air filters & acces	sf	400	5.00	6.50
Air cond & acces	lb	5,500	0.30	0.35
Louvers & acces	sf	1,100	2.00	3.10
Air wash & humidifiers & acces	lb	26,000	0.30	0.34
Elec heaters & acces	kb	15,000	0.30	0.41
Outlet boxes & covers cast ferrous	lb	6,000	1.75	8.20
sheet stl	lb	2,500	4.00	4.63
Cond, rigid stl, ½"	lf	300	1.70	5.70
¾"	lf	35,000	1.50	2.43
1"	lf	5,000	1.70	3.40
1¼"	lf	33,000	2.00	5.44
1½"	lf	7,500	2.30	6.80
2"	lf	8,000	2.50	8.85
2½"	lf	2,500	3.35	12.00
3"	lf	15,000	4.00	12.30
3½"	lf	2,000	5.00	17.80
4"	lf	175	2.00	39.20
flexible stl, ¾"	lf	250	2.10	4.00
1¼"	lf	150	3.30	7.00
1½"	lf	100	3.90	9.70
2"	lf	50	4.90	12.60
non-metallic, 2"	lf	2,000	1.00	1.17
4"	lf	2,000	1.40	1.98
met, non-magn, 2"	lf	1,500	8.00	13.10
3"	lf	500	5.00	24.80
Wire, 600v, insul, #12	lf	65,000	0.20	0.42
#10	lf	14,000	0.20	0.46
#8	lf	13,000	0.25	0.52
#6	lf	4,000	0.35	0.60
#4	lf	6,000	0.45	0.72
#2	lf	7,000	0.60	0.94
#1 0	lf	5,500	0.75	1.11
#2 0	lf	2,500	0.90	1.37
#4 0	lf	12,500	1.25	2.03
500 MCM	lf	9,000	2.35	3.73
750 MCM	lf	7,500	3.20	5.10
Cable, 15kv, armor, 3/c #6	lf	1,000	4.20	6.96
#4	lf	1,000	4.75	6.90
#2	lf	1,200	5.20	7.80
non-armor, 3/c #6	lf	2,000	4.40	6.19
#2	lf	2,000	5.80	7.89
1/c #4	lf	400	1.85	2.05
Control cable, 600v, 2/c #19/25	lf	15,000	0.50	0.64
3/c #19/25	lf	12,500	0.60	0.87
4/c #19/25	lf	10,000	0.80	1.21
5/c #19/25	lf	14,500	0.90	1.39
7/c #19/25	lf	18,000	1.10	1.67
9/c #19/25	lf	7,000	1.45	2.50
12/c #19/25	lf	1,500	1.75	3.75
2/c #19/22	lf	9,000	0.70	1.02
3/c #19/22	lf	4,000	0.85	1.40
4/c #19/22	lf	3,000	1.00	1.70
5/c #19/22	lf	1,500	1.20	2.20
Control cable, 600v, 7/c #19/22	lf	1,200	1.45	2.82
Parkway cable, 600v, 3/c #10	lf	6,000	0.70	1.30
Tel wire, rubber insul, single twisted pair	lf	3,000	0.15	0.70
cable, polyethylene insul, 11 pairs	lf	5,000	0.60	1.56
16 pairs	lf	2,000	0.75	1.95
Cable, tel type, spillway gate hoist, 26 pairs No. 22, AWG	lf	2,000	1.10	2.86
spillway postn indicator, 51 pairs	lf	2,000	1.65	5.35
Cable racks, trays & supports, 12" wide	lf	1,000	4.75	7.20
18" wide	lf	8,000	5.50	9.22
24" wide	lf	2,000	7.00	11.34
Power outl, 600v, 3 ph indoor	ea	25	58.00	84.00
outdoor	ea	30	65.00	89.00
Ground conductors	lb	75,000	1.00	1.66
rods	lf	2,000	3.35	5.87
Light panelbd, indoor 18 circuits	ea	22	350.00	333.00
6 circuits	ea	4	250.00	193.00
4 circuits with autom transf switch	ea	12	525.00	348.00
10 circuits with remot contr switch	ea	1	550.00	390.00
Lighting fixt, type A	ea	111	60.00	68.00
type B	ea	252	50.00	85.00
type C	ea	15	95.00	107.00
type CC	ea	14	90.00	128.50
type D	ea	6	30.00	53.00
type E	ea	82	35.00	20.00
type EE	ea	2	10.00	14.00
type F	ea	15	25.00	29.00
type G	ea	280	11.00	15.80
type H	ea	64	13.00	26.70
type K	ea	82	50.00	71.50
type KK	ea	23	50.00	47.00
type L	ea	20	27.00	29.00
type M	ea	3	60.00	47.00
type N	ea	10	12.50	39.00
type P	ea	200	11.50	22.70
type PB	ea	25	12.00	29.00
type R	ea	16	50.00	45.00
type S	ea	5	17.00	31.00
type T	ea	20	45.00	68.30
type U	ea	23	30.00	54.00
type V	ea	64	11.00	28.00
type W	ea	4	42.00	60.00
type X	ea	44	60.00	93.00
type Y	ea	156	14.00	31.50
type Z	ea	40	60.00	64.70
Lighting strd, type ZZ	ea	30	375.00	375.00
Lamp, strd pkg (60), 25w (120), 40w	ea	2	80.00	123.00
60w	ea	1	45.00	20.00
75w	ea	1	70.00	20.00
100w	ea	1	70.00	20.00
100w	ea	4	80.00	24.00
(60), 150w	ea	3	40.00	13.00
200w	ea	6	45.00	19.00
300w	ea	2	47.00	23.00
(24), 500w	ea	2	30.00	21.00
(24), 300w, mogul	ea	2	20.00	15.00
(6), 1,500w	ea	20	20.00	24.00
Fluorsct lamp, T-12, std pkg (12)	ea	50	60.00	41.00
Toggle sw, single pole	ea	65	2.00	6.00
double pole	ea	5	4.00	12.00
3-way	ea	10	4.00	8.70
Sw, rem contr, 3 pole, 600v, 60A	ea	1	50.00	141.00
push button contr	ea	12	25.00	58.00
Contr unit, photoelec	ea	1	100.00	107.00
Duplex receptcl, 15A, 125v	ea	25	2.00	6.00
Receptcl, 20A, 250v, 2-wire 3-pole	ea	150	7.00	9.00
polarzd 15A	ea	35	3.00	7.00
vaportight 15A	ea	20	10.00	11.50
watertight 20A	ea	30	11.00	12.50
floor	ea	5	20.00	55.00
Transf, dry typ singl ph 25kva	ea	12	580.00	660.00
15kva	ea	2	400.00	450.00
10kva	ea	2	300.00	333.00
5kva	ea	4	230.00	210.00
oil immers, 10kva	ea	5	370.00	345.00
Feed rail, 100A, indoor	lf	100	12.00	18.50
outdoor	lf	2,600	20.00	23.80
500A, outdoor	lf	1,150	36.00	53.20
500A or more (350-t powrhouse cranes)	lf	1,100	35.00	52.10
Safety sw, unfused, 3PST, 600v, 60A	ea	25	43.00	71.00
Circuit breaker, non-autc 3-pole, 600v, 225A	ea	6	200.00	370.00
600A	ea	2	400.00	972.00
Combintn line starter, 600v, 3-pole, NEMA size 1	ea	5	130.00	130.00
size 2	ea	3	200.00	215.00
size 3	ea	1	300.00	325.00
size 4	ea	1	500.00	580.00

Continued on page 86



Lighter area shows big new addition to Mobile, Alabama plant.

National Gypsum's huge plant addition at Mobile helps ease shortage!

Here's National Gypsum's answer to the increased demand for roof insulation board... a huge plant expansion at Mobile, Alabama. This big new addition is already producing more of much-wanted Gold Bond Insulation Board — National's contribution toward easing the shortage.

The Mobile plant is located deep in the Southern pine region, assuring a steady supply of raw materials. The new unit adds a huge 600-foot-long board machine, operating at high speed under close quality control. Gold Bond Roof Insulation Board comes in ½", 1", 1½" and 2" thicknesses... in natural or asphalt-coated finish.

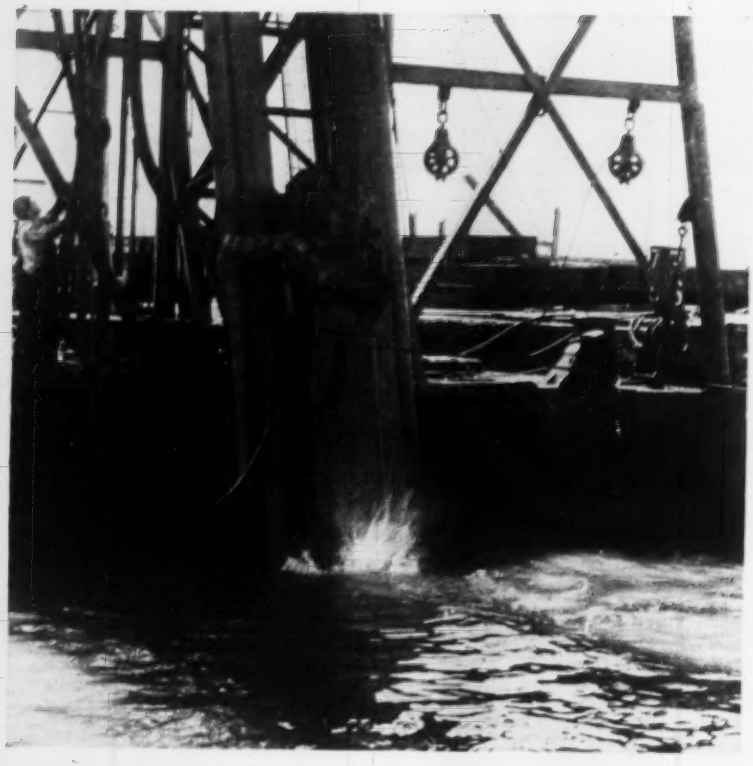
On your next roof job, take advantage of the increased supply of Gold Bond Roof Insulation Board... specify Gold Bond. For technical data or other assistance, call your Gold Bond representative or write to:

NATIONAL GYPSUM COMPANY • BUFFALO 2, NEW YORK

Build better with Gold Bond

. . ROOF INSULATION BOARD

(Advertisement)



A McKiernan-Terry S10 Single-Acting Pile Hammer starts underwater to drive 195-foot 14-inch H-beam 70 feet below water for Richmond-San Rafael bridge foundation on the West Coast. McKiernan-Terry Corporation, 80A Richards Ave., Dover, New Jersey.

WRITE TODAY AND SEE

how you can have Power-Steering for your PRESENT EQUIPMENT

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POWR STEER

Now you can have the economy, efficiency and safety of power steering **without investing in new capital equipment.** Behlen Powr Steer is easily installed on many models of your present tractors, motor graders, etc.—saves time on the job and therefore cuts your labor costs. Cuts time lost and other expense because of wrenched backs, broken arms. Heavy duty design provides effortless turning and steering on the toughest jobs.

FILL IN THIS COUPON TODAY!

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Send me complete information about Behlen Powr Steer for my equipment. Dept. 28

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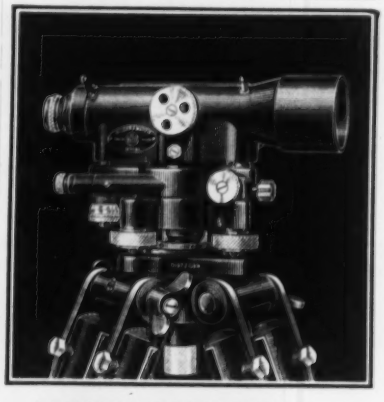

PROVEN IN THE FIELD . . . WHERE PERFORMANCE COUNTS

Watts Microptic Engineers' Levels are tops with foremost construction engineers throughout the country. Here is precision performance, time-saving performance, dependable performance in all climates and terrain. For full information on the complete line of Watts Microptic Engineers' Levels see your nearby Dietzgen Dealer. Made by Hilger & Watts, Ltd., London, sold and serviced in the United States by the Eugene Dietzgen Co.

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DIETZGEN

. . . Unit Prices

Continued from page 84

Bids: 3 12 56 Items	Unit	Quantity	Unit 1C	Prices 2
Pushbutton station	ea	15	15 00	33 00
Selectr swi, 3-position	ea	10	20 00	25 00
Transf, portbl, low-volt	ea	6	40 00	56 00
Tel code call syst, comp exc tel sta & signal devices	ls	job	8,000	17,689
Tel, desk type	ea	2	35 00	68 00
ROW	ea	2	40 00	142 00
wall type	ea	27	40 00	88 00
outdoor type	ea	9	125 00	168 00
handset, portbl	ea	2	35 00	54 00
jack	ea	22	15 00	34 00
Bell, code call, 4"	ea	7	25 00	44 00
6"	ea	7	26 00	52 00
musicl soft tone, 4"	ea	1	40 00	56 00
Horn, elec, vibrating	ea	6	80 00	91 00
Clock, wall, 24"	ea	6	130 00	476 00
12"	ea	10	40 00	80 00
Switchgear, 138kv, sta service cubicle i	ea	14	560 00	1,223
Substa transf, 600v unit section i	ea	6	425 00	1,180
breaker cubicle i	ea	6	400 00	625 00
Substa bus tie breaker cubicle i	ea	3	325 00	627 00
Substa feeder breaker 600v cubicle i	ea	20	140 00	439 00
Sta serv load centr distribtn swibd panel i	ea	6	200 00	826 00
panel bd i	ea	2	675 00	829 00
Main control duplex swibd sec i	ea	16	425 00	556 00
benchbd panel i	ea	16	425 00	474 00
Bd panel, aux i	ea	32	350 00	170 00
Swibd panel, ac-dc distribution i	ea	6	270 00	492 00
Storage battery i	lb	15,000	0 15	0 19
Motor generatr & invertr sets i	ea	3	475 00	573 00
Distrbn panel, aux, 240-120v, ac-dc i	ea	6	200 00	887 00
Generatr grnd cubicle, i	ea	8	1,500	1,614
Subtotal		$56,673,775		$57,677,852

Wanapum Site Subsurface Exploration

River equip, special	ls	job	5,000	10,260
hole set-up	ea	25	400 00	400 00
drill	lf	3,000	16 00	14 00
Land hole set-up	ea	125	150 00	100 00
drill	lf	20,000	10 00	16 20
Pipe observation well	lf	5,000	2 00	2 66
Casing, 4"	lf	600	6 00	4 34
Sample hole, spec, drill	lf	1,000	17 00	25 00
Drill holes, sampl & test	cr hr	2,000	16 00	22 30
Core boxes	ea	450	10 00	11 60
Test pit, excav	cy	400	20 00	8 41
samples	ea	50	10 00	13 60
pumping	hp hr	5,000	0 30	0 34
Subtotal		$378,850		$495,228

Powerhouse Equipment

Items		1	2
Turbines, Kaplan, 114,000 hp, 85.7 rpm, with shaft alignment, eight	f&i	$12,000,000	$11,206,508
Governing equip, compl with aux for 8 turbines	f&i	825,000	786,780
Generators, 83,000kva & apurt for 8 turbines	f&i	12,340,000*	11,324,000
Transformers, 183,000kva incl tools, spec equip & specif spare parts, four	f&i	1,490,000	1,241,137
Transformer, 183,000kva, complete, spare unit	f&i	340,000	308,434
Crane, gantry, emergency	f&i	450,000	466,475
Crane, bulkhead gantry	f&i	160,000	165,639
Cranes, powerhouse, two	f&i	520,000	533,601
Gate & hoists, spillway, chain operted twenty two	f&i	3,000,000	4,056,490
Bulkhead sections, intake, thirty six	f&i	400,000	392,317
Frames & guides incl dogging devices for intake blkhd thirty sets	f&i	145,000	212,180
Wheel gates, intake, four	f&i	255,000	289,902
Frames & guides for intake wheel gates, thirty	f&i	530,000	685,630
Gates, draft tube, six	f&i	135,000	129,124
Frames & guides incl dogging devices for draft tube gates, thirty sets	f&i	210,000	232,754
Trashrack sections, intake, one hundred forty four	f&i	222,000	206,395
Frames & guides for trashracks, thirty sets	f&i	165,000	225,357
Wheel gate carriage, compl with scaff & gate hngrs	f&i	50,000	65,774
Switchgear, cubicle, station type	f&i	330,000	369,920
Bus structures	f&i	475,000	513,213
Cost of performance bond		600,000	638,000

* Includes shaft alignment

Newcomer to Nashville

Tall and slender stands the steel skeleton for the Life & Casualty Building, shown at right shortly after topping out by Bethlehem crews. Heralded as the Southeast's tallest building, the 30-story skyscraper is the new queen of the Nashville skyline.

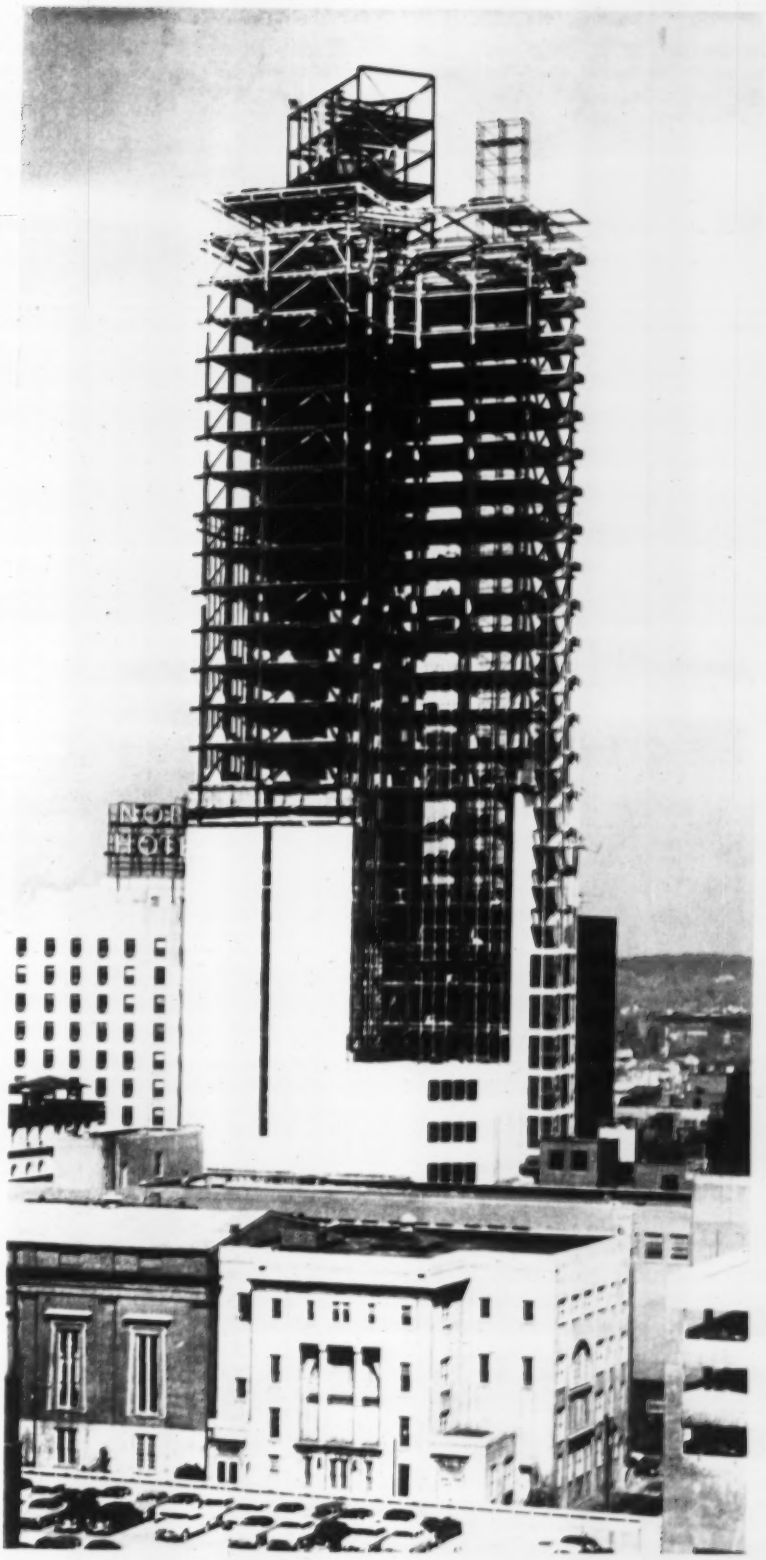
Exterior walls will consist of gleaming metal and glass set off by masonry trim at the corners, and dramatized by a massive metal fin extending the entire 409-ft height of the building. Other features include electronically controlled high-speed elevators, a year-round air-conditioning system, and cellular steel floors. Life & Casualty Insurance Company of Tennessee, the owners, plan to use the building as their home office, leasing excess space to tenants.

The approximately 5350 tons of steel required for the job were fabricated and erected by Bethlehem, using high-strength structural bolts (in accordance with ASTM Spec. A-325) for all stressed field connections.

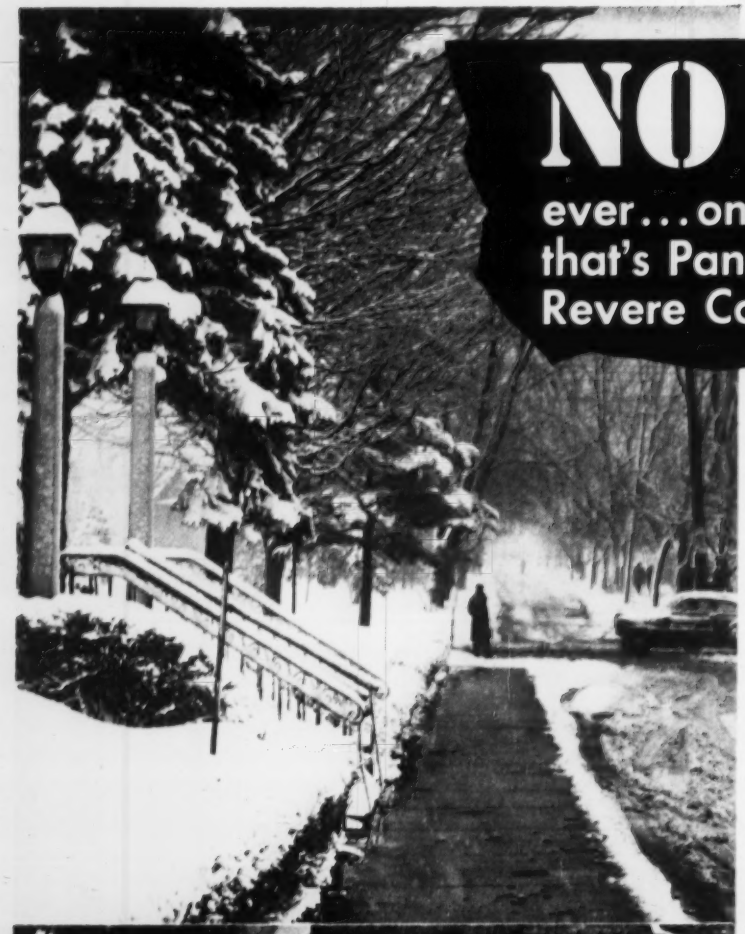
Architect: Edwin A. Keeble Associates, Inc.
Structural Engineer: Ross H. Bryan
General Contractor: J. A. Jones Construction Co.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation
Export Distributor: Bethlehem Steel Export Corporation



BETHLEHEM STEEL



NO SNOW

ever...on the sidewalk that's Panel Heated with Revere Copper Water Tube

Huge strides are being made by this method of snow removal. No wonder, shoveling and accidents due to snowy walks are eliminated . . . while the time and labor saved pays for the installation in short order.

That's why you'll find snow melting panels also being used on driveways, loading platforms, entrance aprons, service stations, pedestrian ramps at railroad stations, airports and similar spots. One application which bears special mention is the use of coils in garages. They quickly melt the snow on cars, keep floors dry as well as keep the repair shop floors warm so mechanics can lie right on the bare concrete in comfort.

And when you make the panels of Revere Copper Water Tube you have these added advantages: Copper can be bent to conform to the terrain. Bendability permits use of sinuous coils, while the 60-foot lengths of tube mean fewer fittings which, when joined by solder means joints that stay tight. Copper tube cannot rust, rot or deteriorate. That's why, on the inside, full flow and low frictional resistance are maintained throughout its long life. While external moisture will not harm it from the outside.

Keep ahead of the parade. Recommend Panel Heating for snow removal. Revere's Technical Advisory Service will be glad to help you in the proper application of Revere Copper Tube in working up your plans.

FREE! Instructive 16mm Full Color Motion Picture, "The ABC of Radiant Panel Heating." Write Advertising Department for details.

REVERE

COPPER AND BRASS INCORPORATED

Founded by Paul Revere in 1801

230 Park Avenue, New York 17, N. Y.

Mills: Baltimore, Md.; Brooklyn, N. Y.; Chicago, Clinton and Joliet, Ill.; Detroit, Mich.; Los Angeles and Riverside, Calif.; New Bedford, Mass.; Newport, Ark.; Rome, N. Y.
Sales Offices in Principal Cities, Distributors Everywhere.

LOWER SECTION OF PHOTOGRAPH shows how non-rusting Revere Copper Tube was imbedded in concrete slab. Top section of photo shows same walk under actual snow conditions. Note bends. Think of all the joints necessary had ferrous pipe been used. And think, too, of what seepage can do to rustable materials. Note insulation used on each supply and return line to the coils from the mains. This provides flexibility in the take-offs from the mains, which have been run below the slab, to allow for movement due to expansion and contraction.

Materials and Labor Prices

Monthly Market Quotations by ENR Field Reporters

See following ENR issues for OTHER PRICES:

- * May 17 — Iron and Steel Products; Pipe
- * May 24 — Wood Products, Glass, Explosives, Chemicals
- * May 31 — Clay Products, Lime, Plaster Paint, Roofing, Wage Rates, Building Board, Lath, Insulation

CEMENT, AGGREGATE, READY-MIXED CONCRETE—F. O. B. CITY

	PORTLAND CEMENT* Per bbl. C. L. lots cash, dis. not deducted			SAND AND GRAVEL Per ton, carload lots			CRUSHED STONE Per ton, carload lots		CRUSHED SLAG Per ton, carload lots, f.o.b. plant		CONCRETE BLOCK 8x8x16-in.* truckload del.* per block		CONCRETE Ready Mixed 1:2:4 ave. 50 c.y., del.
	Paper	Bulk	Mortar	Gravel, 1½ in.	Gravel, ¾ in.	Sand	1½ in.	¾ in.	1½ in.	¾ in.	Sand grav.	Lt. wgt. agg.	
Atlanta	$4.12a	$3.71a	$3.61	$2.75	$2.75	$2.50‡	$2.14	$2.24	$1.65	$1.65	$0.18	$0.195	$13.25g
Baltimore	4.04a	3.63a	3.43	2.70‡a	2.70‡a	2.20‡a	2.75‡a	2.80‡a	1.90‡a	1.90‡a	18	18a	12.15
Birmingham	3.73	3.00e		2.53n	2.53n	2.13n	2.75	2.75	1.55	1.65	18	18	11.55
Boston	4.75b	4.29b	4.55	3.00a	3.00a	3.00a	1.65a	1.75a			23	265a	14.00h
Chicago	3.98a	3.57a	3.72	3.60‡b	3.60‡b	4.00‡b	3.75‡b	3.75‡b	2.25‡	2.25‡	24	24b	13.00
Cincinnati	4.20c	3.80c	3.89	2.19‡c	2.24‡c	2.24‡*	2.54‡c	2.54‡c			205	25a	12.40
Cleveland	N.A. in C.L.	3.59		2.15ef	1.95f	1.75	4.10‡a	4.10‡a	3.35‡a	3.15‡*		23	15.45
Dallas	3.35a	2.95a	3.23	2.42	2.53	1.84	2.22	2.38			11e	267.5	11.25
Denver	4.50a	4.00a	4.50	1.85	2.00	1.20					23	255a	10.70
Detroit	4.05a	3.45a	3.70	4.25‡b	4.25‡b	4.00‡b	3.75‡	3.75‡	3.50‡	3.50‡	22	22a	14.20
Kansas City	4.20b	4.00b	4.00	1.65	1.65	2.00a	2.00‡a	2.00‡a			20a	24c	13.00b
Los Angeles	4.92eA	4.46eA	5.40	2.41‡a	2.76‡a	2.41‡a	2.41‡a	2.46‡a			145fm	255m	12.90h
Minneapolis	4.39a	3.98a	3.89	2.70‡ag	2.70‡ag	1.60‡ag	3.25‡ag	3.25‡ag			19		13.35f
Montreal	3.11d	2.86d		1.95‡a	2.20‡a	2.25‡a	1.95‡a	2.20‡a			20	20a	10.80ek
New Orleans	3.55a	3.15a	3.48	2.44	2.44	2.00			1.45	1.65	27.5		13.65
New York	4.41a	4.00a	3.73	3.05bk	3.05bk	2.00bk	2.90bl	2.90bl					15.20km
Philadelphia	3.88/4.27‡a	3.57/3.94‡a	3.49/4.12‡	2.85‡ap	2.85‡ap	2.35‡ap	2.70‡	2.80‡	2.00	2.35	22/28		13.20de
Pittsburgh	4.15a	3.76a	3.75	2.40‡	2.40‡	2.20‡	2.60‡	2.60‡	2.15	2.15	25d	31	14.00
St. Louis	3.86/4.18e	3.46/3.78e	3.21/4.03	3.25am	3.10am	2.40/3.10am	1.75j	1.75j			22	28e	12.90
San Francisco	3.98c	3.54c		2.02	2.02	2.12	2.17	2.17			24	28d	12.50c
Seattle	4.30a	3.75a		4.00‡bm	4.00‡bm	4.00‡bm	4.50‡bm	4.50‡bm			28	38	13.30p
Toronto	3.97	3.77	3.77	2.25	2.25	1.85	2.00	2.00	2.00	2.00	28	31c	14.15

‡ Delivered. * Prices incl. dealers discount except as noted.

CEMENT: *a Less 10¢ disc, 15 days. *b Less 2% disc, 15 days. *c Less 10¢ disc, 10 days. *d Truckload lots, deliv. 10¢ disc, 20 days. *e Truckload lots, destination price. *h LCL.

SAND, GRAVEL, STONE & SLAG: *a Truck lots. *b Per cu. yd. *c 5 tons or more. *e ½". *f Pea gravel. *g Less 5% for cash. *h Less than 5 tons. *i Plus 5% mun. & prov. tax *j F.o.b. quarry. *k Barge lots asd. *l F.o.b. scow Hudson river. *m Less 2% for cash. *n F.o.b. cars. *o 1-3 mi zone. *p Add 10¢ for ea. add'l mi zone.

CONCRETE BLOCK: *a Cinder *b Waylite. *c Haydite. *d Celocrete *e 5⅓ x 8 x 12 in. *f 8 x 4 x 16. *g F.o.b. truck at job. *i Less 2% for cash *l F.o.b. plant San Rafael. *m F.o.b. yard.

READY MIXED CONCRETE: *a 5 cu. yds. or over del. Man. *b 25 cu. yds or more *c 10-100 cy. brackets. *d 1-3 mi. zone. *e 2,000 lb comp. *f 2,500 lb. comp. *g Less 25¢ disc, 15 days. *h Less 50¢ for cash. *i 5% off for cash. *j 2% off for cash. *k Federal tax included. Add 5% mun. & prov. *l 1-2½-3½. *m F.o.b. yard. *n Plus escalator clause. *o Add 15¢ for ea. add'l 3-mi zone.

CASH DISCOUNTS CEMENT to Contractors: Truck delivery, 2% for cash on 10th of month; on carload deliveries, no trucking, same as dealer cash discount 10¢ per bbl. for payment within 15 days of date of invoice. Subject discount 10¢ per bbl. 20 days in Montreal.

CURRENT MAXIMUM PRICES AT CEMENT MILLS

Charge for bags not included. For paper bags add 40¢ per bbl., not refundable.

	Bulk		Bulk		Bulk		Bulk		Bulk
Richard City, Tenn	$3.05†	Buffington, Ind	$3.10†	Steelton, Minn	$3.20†	Muskegon, Mich	$3.15†	Toledo, O	$3.15†
Clinchfield, Ga	3.05†	Independence, Kan	2.95†	Leeds, Ala	3.00†	Saginaw, Mich	3.15†	Milwaukee, Wis	3.20†
Kingsport, Tenn	3.05†	Hannibal, Mo	3.10†	Duluth, Minn	3.20†	Wyandotte, Mich	3.15†	Green Bay, Wis	3.20†
West Des Moines, Iowa	3.10†	Northampton, Pa	3.05†	Hudson, N. Y	3.05†	Buffalo, N. Y	3.25†	Ironton, O	3.15†
Nazareth, Pa	3.05†	Universal, Pa	3.20†	Alpena, Mich	3.05†	Oswego, N. Y	3.30†	Montreal City	2.56†
Bath, Pa	3.05†	Waco, Tex. (+ 10¢ tax)	3.10†	Detroit, Mich	3.15†	Cleveland, O	3.20†	W. Winfield, Pa	3.20†

† *Prices to hold for Second quarter of 1956.*

PAVING BRICK, BLOCK, ASPHALT, ROAD OILS—F. O. B. CITY

	PAVING BRICK AND BLOCK			PAVING ASPHALT Per ton, less than 80 penetration		ASPHALT BINDERS FLUXES Per gal., 80-300 penetration		CUTBACK ASPHALT MC per ton		ROAD OIL Per gal.	ASPHALT EMULSION RSI Per gal.	
	Granite Per M lots of 50,000 4x4x8 in.	Brick per M 3x4x8½ in. carload lots	Wood per sq. yd. 3½ in. 18-lb. treat	Tank car	Drums	Tank car	Drums	Tank car	Drums	Tank car	Tank car	Drums
Atlanta				$27.00	$40.00	$0.115	$0.23	$0.114 Fe	$0.276 Fe	$0.15	$0.15	$0.25
Baltimore	150.00‡			21.50e		.092e	0.182e	10.0eE	195.0eE	10e	195a	0.195a
Birmingham		62.00e										
Boston				22.00eap	35.00eap	22.00ea	30.00ea	095eF'e	195eF'e	095a	095aG	175aG
Chicago	155.00‡	85.00‡b	3.95/4.00‡j	21.85b	31.85b	20.85ea	30.85ea	100eH	180eH	09b		
Cincinnati												
Cleveland		82.00d	5.00g	23.00A		23.00A		1025AeF			1025AG	20AG
Dallas	e	40.00	e	24.45	43.19	.1630	1858	28.91	50.44	098	1087	1960
Denver		50.00										
Detroit		112.00		29.65		29.65a		1285eI		0688		25
Kansas City	e	e	e	8.00cl		17.40a		075eJ		065c	0.11	
Los Angeles	e		e	17.00dmx		17.00deK		19.00eK		18.00de	0875f	1875f
Minneapolis			2.97A	26.50		0.115a		0.115a		0.105	1125	
Montreal	e	e	e	27.00a	39.00a	135n	198n	16.50eaE	20.90eaE	132a	195ea	235ea
New Orleans				17.00e	a	17.00es	a	185eu	a	0850l	0850l	
New York			3.90f	23.80eCD	44.50eD	23.80eCD	44.50eD	1073eCDF	1935eDF		1073CD	1968D
Philadelphia	175/185	110/120	4.06	22.00		22.00		0.95eF		095		
Pittsburgh	165.00	48.00	4.60	27.00	38.00	.10	21	27.00F	40.00E	098	11	224
St. Louis				18.75f		1704		0863f		0.1595	10	
San Francisco		70.00c		20.50g	37.50g	20.50gko	37.50gko	21.50gN	39.00gN	23.25ae	1625g	1825e
Seattle				24.50e	38.50h	18.75he		26.00K		22.25he	1625h	1925he
Toronto			4.03	33.80	55.14	0.19	0.24	0.20e	0.25e	0.20	0.20	24

h Delivered.

PAVING BRICK & BLOCK: *a CL. *b 3 x 4 x 8. *c 2¼ x 8¼ x 4. *d LCL, truck deliveries. *e Not used. *f 2" interior 6# treat. *g 3" *h 2" tr. 8# *i 3 x 3½ x 8½. *j 2½", 6 lb. tr.

ASPHALTS: *a Price at plant, Everett, Mass. *b F.o.b. refinery, Lockport, Ill. *c F.o.b. Sugar Creek, Mo. *d F.o.b. refinery, El Segunda. *e F.o.b. Baton Rouge. *f F.o.b. Hartford, Ill. *g F.o.b. Richmond, Calif. *h F.o.b. Martinez. *i F.o.b. refinery, Baltimore. *j F.o.b. refinery, Inglewood, Calif. *k 50-110 penetr. *l Less than 100 penetr. *m 40-80 penetr. *n Fed. tax included; add 5% for mun. & prov. *o Drums not avail. Shipped in steel bbl. *p 60-70 penetr. *q 40-85 penetr. *r In customer's drums. *s Shipped in drums, per drum. *t 85-200 penetr. *u Per 100 gal. *v Per ton. *w Per gal. *x Also tank trucks. *y F.o.b. Oakland *z F.o.b. Edmonds. *A F.o.b. refinery, Cleveland. *B F.o.b. Destrehan La. *C Bulk. *D Prices based on transporting to Manhattan via truck. *E RC. *F Also RC. *G Also MS, SS. *H RC 0-5 incl. *I MC 4. *J MC, RC 0875. *K MC 3, 4 & 5. *L Ms. *M MC 1, 5, RC 1, 5. 099. *N MC 3. *P F.o.b. refinery Savannah. $0.09 gal., tank cars; $0.20 gal., drums.

Bids Asked—Low Bidders—Contracts Awarded—First Section—

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 36, N. Y., ELSIE EAVES, Manager
J. A. MAHONEY, M. WETZEL, L. M. FELIX, M. E. SCIORRA, F. S. DEMBEK, Reports.
J. H. WEBBER, M. R. ROESSLER, E. R. HUBER, Statistics.

NEW ENGLAND

HEAVY CONSTRUCTION—BA

▲ Mass., Boston—PIER—BA. 5/25—Commonwealth of Mass., Port of Boston Comn., c/o Div. Bldg. Constr., 18 Chauncy St., Boston. W-702 Contr. 1, Commonwealth Pier No. 5, South Boston. $1,567,000. Plans deposit $100, refundable. Fay, Spofford & Thorndike, 11 Beacon St., Boston, engrs. CD 11/21/55, under LB.

BUILDINGS—BA

▲ Mass., Greenfield—SCHOOL—BA. 5/23—Town, c/o Supt. Schools, 125 Federal St., high school, Silver St. $2,440,000. Plans deposit $150, refundable. James A. Britton, 315 Federal St., archt. CD 4/23/55.

HEAVY CONSTRUCTION—LB & CA

▲ W. H. Hinman, North Anson, Me. LB $1,109,432, est. $1,080,000 airport runway, taxiway constr. Municipal Airport, PORTLAND, ME. City, City Hall, Portland, Me. Bids Apr. 27. CD 4/12.

▲ MASSACHUSETTS—Commonwealth of Mass., Metropolitan Dist. Comn., Parks Div., 20 Somerset St., Boston,
Cleman Brothers Corp., Readville, Mass. LB $2,518,909. Contr. NBK 929, Squire Bridge reconstr. at Somerville. Bids Apr. 26. CD 4/4.

▲ MASSACHUSETTS—Commonwealth of Mass., Metropolitan Dist. Comn., Parks Div., 20 Somerset St., Boston,
Coleman Bros. Corp., 85 Sprague St., Readville, Mass. CA $2,518,909, est. $2,575,000. Squires Bridge reconstr. Monsignor McGrath Hy., Somerville. Bids Apr. 26, awarded Apr. 27. CD 4/30, under LB.

▲† The Lane Constr. Corp., P.O. Box Drawer 911, Meriden, Conn. LB $1,389,252, est. $1,274,424. Barre Falls Dam, Barre, Rutland, Hubbardston and Oakham, CIVENG 19-016-56-103, MASSACHUSETTS. U. S. Eng., 150 Causeway St., Boston, Mass. Bids Apr. 18. CD 4/11.

▲† Frederick J. Raff Co., 271 Sheldon St., Hartford, Conn. CA $1,552,036, est. $1,525,000. imprv. steam plant (2nd increment), Charlestown, NOy 90056, Spec. 48802, BOSTON, MASS. First Naval Dist., 495 Summer St., Boston, Mass. CD 4/26, under LB.

▲ RHODE ISLAND—State R. I. and Prov. Plants, Div. Purchases, State House, Providence,
M. A. Gammino Constr. Co., 728 Valley St., Providence, R. I., LB $1,774,696. Contract 5603, Bid No. 708, hy. work 7.44 mi. West Main Rd.; FAP F-013 (1) Middletown and Portsmouth; LB $1,096,560. Bid 709, Contract 5616, hy. work Kickemuit Rd.-Metacon Ave.-Ferry Rd. to Mt. Hope Bridge, Warren and Bristol. Bids Apr. 25. CD 4/11.

▲ Baylor Constr. Co., 210 E. 40 St., New York, N. Y. LB $3,135,000, Item 1, Division 1; LB $509,440, Item 1, Division 2, sewage treatment plant, Fields Point, PROVIDENCE, R. I. City, Purch. Dpt., City Hall, Providence, R. I. Bids Apr. 30. CD 4/25.

† Anderson Fairoaks Constr. Co., 145 S. Marshall St., Hartford, Conn., LB $598,200, est. $661,900, air national guard operations and training bldg., Bradley Field, ENG-19-016-56-121, WINDSOR LOCKS, CONN. U. S. Eng., 150 Causeway St., Boston, Mass. Bids Apr. 27.

BUILDINGS—LB & CA

▲ E. Turgeon Constr. Co., Inc., 42 Weybosset St., Providence, R. I., CA $1,288,997. ELEMENTARY SCHOOL, Willard Ave. Section, South Providence, PROVIDENCE, R. I. City, School Dpt., 20 Summer St., Providence, R. I. Bids Apr. 16. CD 4/19, under LB.

Elci Co., 16 Fowler Court, New London, Conn., LB $977,613, JUNIOR HIGH SCHOOL, EAST LYME, CONN. Town School Bldg. Comn., Town Hall, East Lyme, Conn. Bids Apr. 24. CD 4/4.

MIDDLE ATLANTIC

HEAVY CONSTRUCTION—BA

▲† New York—BA. About 6/25—U. S. Eng., Engineer Park, Niagara and Bridge Sts., Buffalo, Zone 7, constr. Grass River Lock approach channel, St. Lawrence Seaway, St. Lawrence River, CIVENG-30-073-56-71, for St. Lawrence Seaway Development Corp. CD 9/9/54.

BUILDINGS—BA

Md., Baltimore—SCHOOL—BA. 5/16—City, Bureau Bldg. Constr., 410 Municipal Bldg., Zone 2, 2 story, masonry Rutland Elementary School, Rutland Ave., Fedral, Regester and Lanvale Sts. $750,000. Plans deposit $50, Edw. J. Hofstetter, 2025 E. North Ave., Zone 13, archt. CD 11/9/54.

N. J., Bordentown—TRAINING and RESEARCH CENTER—BA 5/24—N. J. Dpt. Treasury, Div. Purchases & Property, State House, Trenton, training and research center (3 bldgs.) addns., alterations, $600,000. Kramer, Hirsch & Carchide, 115 W. State St., Trenton, archts.

N. J., Elizabeth—SCHOOL—BA. 5/24—Bd. Educ., City, City Hall, Abraham Lincoln School No. 14 addn., Grove and Murray Sts. $586,000. Albert A. Kaufmann, 252 N. Broad St., archt. CD 9/9/47.

HEAVY CONSTRUCTION—LB & CA

▲ Charles F. Vachris, Inc., 9024 Ditmars St., Brooklyn, N. Y. CA $1,798,387. substructure bridge over Arthur Kill Channel from Staten Island, N. Y., to Elizabeth, N. J., NEW YORK and NEW JERSEY. Baltimore & Ohio R.R., Charles and Baltimore Sts., Baltimore, Md. CD 4/30.

▲ Peter Kiewit Sons, Inc., & Morrison-Knudsen Co., 122 E. 42 St., New York, N. Y., CA $12,378,093. channel imprvs., Point Three Points, Leishman's Point and Ogden Island near Waddington, St. Lawrence County, Spec. PA-5-11008, St. Lawrence Contr. No. 27, NEW YORK Power Authority of the State of New York, 270 Broadway, New York 7, N. Y. CD 4/23, under LB.

▲† Tecon Corp., 1201 Main St., Dallas, Tex. CA $4,745,887. St. Lawrence Seaway work dredging in Thousand Islands sect. of river, removing 204,000 cu. yd. rock and 8,000 cu. yd. earth in lowering 33 shoals between Clayton and Alexandria Bay, St. Lawrence Seaway Development Corp., NEW YORK, U. S. Eng., Engineer Park, Niagara and Bridge Sts., Buffalo 7, N. Y. CD 3/29, under LB.

Cranford Co., Inc., 52 Ninth St., Brooklyn 15, N. Y. LB $912,456 (6 bidders) storm sewers in W. 12, W. 8, W. 5 Sts.; sanitary sewers in W. 12, W. 8 and W. 5 Sts., storm and sanitary sewers in Surf Ave., BROOKLYN, N. Y. President Brooklyn Boro, Boro Hall, Brooklyn 1, N. Y. Bids Apr. 26. CD 4/18.

▲ Melbros Constr. Co., Inc. & Manco Constr. Co., 1209 61 St., Brooklyn 19, N. Y. CA $2,117,443. (4 bidders) storm sewer in Gerritsen Ave., Bartlett Place, Lois Ave., Noel Ave., Just Court, Madoc Ave.; sanitary sewer in Gerritsen Ave., Abbey Court, Beacon Court, Canton Court, Dare Court, Eaton Court, Frank Court, Noel Ave., Gain Court, Hymen Court, Ivan Court, Just Court, Madoc Ave., Bartlett Place, Kay Court, Merit Court, Cyrus Ave., Keen Court, Seba Ave., Opal Court, Post Court, Lois Ave.; grading Cyrus, Lois and Noel Aves., Bartlett Place, Kay Court, Keen Court, Post Court, Abbey Court, Dare Court, Noel Ave., Ivan Court, BROOKLYN, N. Y. President Brooklyn Boro, Boro Hall, Brooklyn 1, N. Y. CD 3/29, under LB.

▲ NEW JERSEY-PENNSYLVANIA—Delaware River Port Auth., Administration Bldg., Bridge Plaza, Camden, N. J.,
Public Constructors, Inc., P. O. Box 247, Gloucester, N. J., CA $1,045,239. North-South Freeway to Black Horse Pike, Walt Whitman Bridge, Contract G-6, Bids Apr. 12. CD 4/19, under LB.

▲ NEW JERSEY-PENNSYLVANIA—Delaware River Port Auth., Administration Bldg., Bridge Plaza, Camden, N. J.,
Glasgow, Inc., Glenside, Pa., CA $2,426,339. Contract P-9, Walt Whitman Bridge approaches, roadway, paving, drainage, Vare Ave. to Front St. Bids Apr. 12. CD 4/20, under LB.

▲ NEW JERSEY—State Hy. Dpt., State Hy. Office Bldg., 1035 Parkway Ave., Trenton,
Samuel Braen's Sons, Hawthorne, N. J., CA $1,318,634, paving U. S. Route 202 Freeway from Route 10 to U. S. Route 46, Hanover and Parsippany-Troy Hills Twp. Fed. Proj. I-IN 202 (1) Morris Co., N. J. Bids Apr. 3, awarded Apr. 19. CD 4/9.

MARYLAND—State Rds. Comn., 108 E. Lexington St., Baltimore, Zone 2,
Rea Constr. Co., Box 2015, Charlotte, N. C. CA $992,039. surf. 1.445 mi. State Rte. 193, and 3 span steel beam bridge over N.W. branch, Anacostia River, Contr. P 734-2-520, Prince Georges Co. CD 3/12, under LB.

▲ Jos. F. Hughes & Co., 5 E. Franklin St., Baltimore 2, Md. CA $1,806,053. Contr. PT-123, toll plaza admin. and maintenance bldg., service area, Patapsco Tunnel Proj., MARYLAND. State Rds. Comn., 108 E. Lexington St., Baltimore 2, Md. CD 4/3, under LB.

▲† Williams Constr. Co., Box 145, Middle River, Md. LB $2,095,747 (9 bidders) Air National Guard Facilities at Glenn L. Martin Airport, site preparation, demolition, grading, drainage, constr. runways, taxiways, parking areas, lighting, utilities, MIDDLE RIVER, MD. U. S. Eng., 24 St. and Maryland Ave., Baltimore 18, Md. Bids Apr. 24. CD 4/20.

BUILDINGS—LB & CA

▲ ARC Woods Estates, c/o Peter Butler, archt., 172 State St., West Englewood, N. J. Owner Builds. $1,850,000. 50 HOUSES on tract at Elm Rd. and Lang Hill Rd., BRIARCLIFF MANOR, N. Y.

▲ H. R. H. Constr. Corp., 16 W. 46 St., New York 19, N. Y. CA $3,576,000. (9 bidders) foundations and general constr. for Summer HOUSES (Proj. No. NYS-58-4, Sect. II), incl. Bldgs. Nos. 8 to 13 (inclusive) located in area bounded generally by Park Ave., Summer Ave., Myrtle Ave. and Troop Ave., in Brooklyn Boro, BROOKLYN, N. Y. New York City Housing Auth., 299 Broadway, New York 7, N. Y. CD 3/22, under LB.

Forest Estates Homes, c/o Alwin Cassens Jr., archt., 145 S. Franklin Ave., Valley Stream, N. Y. Owner Builds. $800,000. 30 HOUSES on tract at Northern Blvd. and Sugar Tom Lane, EAST NORWICH, N. Y.

▲ West Lake Park Homes, c/o Lantry & West, Inc., 16 Mill Rd., Tuckahoe, N. Y. Owner Builds. $1,500,000. 50 HOUSES on tract at West Lake Dr. east of Stevens Ave., MOUNT PLEASANT, N. Y.

▲ Caristo Constr. Corp., 26 Court St., Brooklyn 2, N. Y. CA $1,937,000. (9 bidders) general constr. Public SCHOOL 111, W. 51 St. and 10 Ave., Manhattan Boro, NEW YORK, N. Y. Bd. Educ., Bureau Constr., 42-15 Crescent St., Long Island City 1, N. Y. CD 3/5, under LB.

▲ Peter Doelger, Inc., 407 E. 55 St., New York, N. Y. CA Est. $3,725,000. 13 Story, 100x100 ft. aluminum and glass HEADQUARTERS, 51 St. and Third Ave., NEW YOK, N. Y. Girl Scouts of the U.S.A., 133 E. 62 St., New York, N. Y. William T. Meyer, 201 E. 67 St., New York, N. Y., archt. Skidmore, Owings & Merrill, 575 Madison Ave., New York, N. Y., designing archts.

▲ Suburban Greens Homes, c/o Stanley Shaffel, archt., 166-21 90 Ave., Jamaica, N. Y. Owner Builds. $2,000,000. 98 HOUSES on tract at Manetto Hill Rd., south of Northern State Parkway, PLAINVIEW, N. Y.

▲ H. Sand & Co., Inc., 11 Park Place, New York 7, N. Y. CA $1,043,650. heating work for addnl. POWER PLANT facilities, Creedmoor State Hospital, QUEENS VILLAGE, N. Y. Bureau Contracts & Accounts, The Gov. Alfred E. Smith State Office Bldg., Albany, N. Y. CD 4/17, under LB.

▲ Wagner College, 631 Howard Ave., St. George, N. Y., rejected bids Mar. 19. DORMITORY, DINING ROOM on campus, ST. GEORGE, N. Y. Plans to be revised and new bids taken. CD 3/26, under LB.

(Continued on page 92)

PROJECTS COVERED

By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $44,000; other public works $73,000; industrial buildings $93,000; other buildings $344,000. Also Foreign projects of $100,000 and more in size of interest to American contractors.

By Regions & Classes of Construction

(In order of Listing)

BIDS ASKED
LOW BIDDERS
CONTRACTS AWARDED

New England	**Middle West**
Middle Atlantic	**West of Mississippi**
South	**Far West**

PROPOSED WORK

Water Supply	**Public Buildings**
Sewers, Waste Disposal	**Mass Housing**
Bridges	**Commercial Buildings**
Streets & Roads	**Industrial Buildings**
Earthwork, Waterways	**Unclassified**

In These Stages

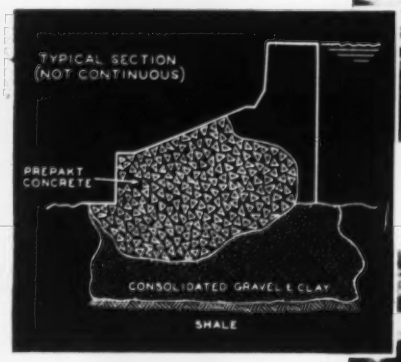
PROPOSED WORK: Before and including appointment of engineers or architects.
BIDS ASKED: BA (new announcements only). For full calendar, see also preceding issues.
SOON LETS CONTRACT: SLC
LOW BIDDERS: LB On jobs below $500,000 in value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.
CONTRACTS AWARDED: CA Except awards to low bidders previously reported in low bidder stage.
CD dates shown are of Construction Daily issue in which last previous report was published.
OWNERS, ENGINEERS, ARCHITECTS, CONTRACTORS are invited to report their new jobs for listing in these reports when they meet or exceed the size minimums shown above. Address these news releases to J. A. Mahoney, REPORTS, ENGINEERING NEWS-RECORD, 330 W. 42 St., New York 36, N. Y.

Symbols and Abbreviations Include:

† Federal Government
▲ Project of $1,000,000 or over.
ENR Engineering News-Record
CD Construction Daily
For additional reports see Construction Daily.

BEFORE—Large concrete section broke away from Fall River Dam in 1951 flood. Gravel strata under dam also permitted extensive leakage, serious in drought-ridden area.

Owner: City of Eureka, Kansas
George E. Jackson, Commissioner of Streets and Utilities



Profile of Fall River Dam

AFTER—Fall River Dam today is better than new. INTRUSION-PREPAKT sealed dam and substrata against leakage, then replaced eroded concrete. Repairs avoided costly alternative of new dam.

flood-damaged dam gets new lease on life

Economical INTRUSION-PREPAKT repairs have restored the deteriorated Fall River Dam near Eureka, Kansas, avoiding the expense of a new dam. The 50-year old structure, flood-damaged and leaking badly, was in critical condition.

Leakage was halted by a procedure of drilling, washing and pumping INTRUSION grout to (1) consolidate porous clay and gravel under the dam and (2) fill voids and honeycomb in the dam. Some 6500 cu. ft. of INTRUSION grout sealed the leakage effectively.

Eroded concrete was replaced with PREPAKT concrete, made by consolidating preplaced aggregate with INTRUSION mortar. Some 290 cu. yds. were placed with no dewatering necessary. Dense, impermeable PREPAKT concrete has a strong, tight bond to existing concrete and superior resistance to cyclic freezing and thawing. It can be made underwater as well as in the dry.

INTRUSION-PREPAKT specializes in the construction and maintenance of heavy concrete structures and foundations; maintains a complete field construction organization; provides engineering service. For information, write: INTRUSION-PREPAKT, Inc., Room 779-K, Union Commerce Bldg., Cleveland 14, Ohio. In Canada: INTRUSION-PREPAKT, Inc., 159 Bay Street, Toronto, Ontario.

INTRUSION-PREPAKT, INC.

OFFICES IN PRINCIPAL U.S. AND FOREIGN CITIES

Intrusion and Prepakt are trade marks of Intrusion-Prepakt, Inc. Cross methods and materials are covered by U. S. Patents Nos. 2313110, 2655004, 2434322 and others, also patents pending.

(Continued from page 90)

Forked River Point Co., Att. William Hausworth, Forked River, N. J., Separate Contracts, $500,000. 50-unit RESIDENTIAL DEVELOPMENT, FORKED RIVER, N. J. Paul B. West, Toms River, N. J., archt.

▲ **Brown & Matthews,** 404 Fourth Ave., New York, N. Y. CA Est., over $1,000,000. design and construct 100,000 sq. ft. RESEARCH and PILOT PLANT, FRANKLIN, N. J. Maral Holding Corp., c/o Hewitt-Robbins, Inc., lessee, 270 Passaic St., Passaic, N. J.

▲ **Frank Briscoe Constr. Co.,** 287 S. 19 St., Newark, N. J., CA, 5 story, 67,000 sq. ft. PLANT OFFICE, east side of Park Ave., LINDEN, N. J. Esso Standard Oil, Research & Eng. Div., 125 Broad St., Elizabeth, N. J. Ray O. Peck, 1 Park Dr., Westfield, N. J., archt.

▲ **Sovereign Constr. Co. Ltd.,** 1181 Broadway, New York 1, N. Y., CA $1,564,888, housing, 20 bldgs. incl. 109 units, PRINCETON, N. J. Institute of Advanced Study, Olden Lane, Princeton, N. J. Bids Apr. 12. (Correction—contractors name). CD 4/19, under LB.

James D. Scully, 6722 Broad St., and **Frank T. Barbera,** 4801 Filmore Terrace, Phila., Pa., Separate Contracts, $900,000. 100-unit RESIDENTIAL DEVELOPMENT, Bethel Rd., etc., SOMERS POINT, N. J.

O. H. Martin & Assoc., 18 First St., Sharpsburg, Pittsburgh, Pa. CA Est. $700,000. 2 story, bsmnt., 55x193 ft., brick, steel OFFICE, BEAVER FALLS, PA. Babcock & Wilcox Co., Beaver Falls, Pa. CD 4/18, under LB.

▲ **Rosewood Gardens,** Att. Charles H. Helms, Norristown and County Line Rds., Hatboro, Pa. Separate Contracts. $1,000,000. twelve 2 story, brick, concrete APARTMENT bldgs., 96 units, GLENSIDE, PA.

▲ **Melfran Corp.,** 4518 Ludlow St., Phila., Pa. Separate Contracts. $1,000,000. RESIDENTIAL DEVELOPMENT, 60 units, Township Line Rd., HAVERTOWN, PA. Henry S. Berg, 1411 Walnut St., Phila., Pa., archt.

Master Masons Constr. Co., 1619 W. Thompson St., Phila., Pa. LB $683,795. general contract 1 story, brick, stone HIGH SCHOOL addns., alterations, HUNTINGDON VALLEY, PA. Lower Moreland School Bd., Huntingdon Valley, Pa. Bids Apr. 23. CD 3/28.

▲ **Sanderson & Porter,** 52 Williams St., New York, N. Y. CA Est. $26,260,000. design and construct GENERATING PLANT, OFFICE LABORATORY and equip., REESDALE, PA. West Penn Power Co., 14 Wood St., Pittsburgh, Pa. (Correction—cost). CD 4/27, under CA.

▲ **Dravo Corp.,** Neville Island, Pittsburgh, Pa. CA Est. $25,000,000. design and construct, ORE SINTERING FACILITIES, along B. & L.E. R.R., incl. crush iron ore into pellets, reservoir, water well, paving, sintering units and railroad sidings, Clinton Twp., SAXONBURG, PA. U. S. Steel Corp., 525 Wm. Penn Place, Pittsburgh, Pa.

▲ **John Volpe Constr. Co.,** 1507 "M" St. N.W., Wash., D. C., LB $7,188,000. Arthur Clapper DWELLINGS, D. C. 1-20, incl. 612 dwelling units, 2 and 7 Sts., Virginia Ave. and M Sts. S.E., WASH., D. C. National Capital Housing Auth., 1729 New York Ave. N.W., Wash., D. C. Bids Apr. 26. CD 4/18.

▲ **Bureau Contracts & Accounts,** The Gov. Alfred E. Smith State Office Bldg., Albany, N. Y., rejected bids Mar. 22, 5 INFIRMARY BLDGS., KITCHEN BLDG., etc. Willowbrook State School, WILLOWBROOK, N. Y. Project to be redesigned. New bids in 2-3 months. CD 3/28, under LB.

▲ **Fred J. Brotherton, Inc.,** 185 Atlantic St., Hackensack, N. J., CA, $1,035,910 general constr. Morris Hills Regional High SCHOOL addn., ROCKAWAY, N. J. Bd. Educ., Morris Hills Regional High School, Rockaway, N. J. Bids Apr. 5. CD 4/12, under LB.

▲ **Sanderson & Porter,** 52 Williams St., New York, N. Y. CA Est. $2,260,000. design and construct GENERATING PLANT, OFFICE LABORATORY and equip., REESEDALE, PA. West Penn Power Co., 14 Wood St., Pittsburgh, Pa. CD 7/21.

SOUTH

HEAVY CONSTRUCTION—BA

▲ **LOUISIANA**—BA 5/22—Mississippi River Bridge Auth., 422 City Hall, New Orleans, superstructures of New Orleans and Algiers approach viaducts for Greater New Orleans Bridge over Mississippi River. Work divided into following contracts, No. 9A, New Orleans approach viaduct, No. 9B, Algiers approach viaduct. Plans deposit $20. Modjeski & Masters, State Street Bldg., Harrisburg, Pa., engrs. CD 8/1/53

BUILDINGS—BA

▲ **Fla., Miami**—NEWS—BA 5/22—Miami Daily News, 600 Biscayne Blvd., 3 story, 217x227 ft. Miami Daily News Bldg., air-conditioned, between N.W. 7 St. and Miami River east of N.W. 12 Ave., $5,000,000. Weed-Russell-Johnson Assocs., 550 Brickell Ave., archts. Jorgensen & Scheffler, 1200 S.W. 1 St., structural engrs. CD 1/17.

BUILDINGS—SLC

▲ **Fla., Surfside**—HOTEL—Florida Hotel Co., c/o M. Tony Sherman, 625 N.E. 78 St., Miami, soon lets contract 6 story 170x185 ft., T-shaped hotel, swimming pool 9441 Collins Ave. "The Florida Shores", $1,500,000. CD 4/20.

HEAVY CONSTRUCTION—LB & CA

▲† **Diamond Constr. Co.,** Ocean Steamship Terminal, Savannah, Ga., LB $9,094,487 (4 bidders) Pier 12 and facilities, Naval Base, NOy 89504, Spec. 47351, NORFOLK, VA. Dist. P. Wks. Office, Fifth Naval Dist., U. S. Naval Base, Norfolk 11, Va. Bids Apr. 24. CD 3/23.

▲† **Williams Constr. Co.,** Middle River, Baltimore, Md., LB $1,819,032, runway exten., taxiway and apron Air National Guard, Martinsburg Municipal Airport, MARTINSBURG, W. VA. U. S. Eng., 237 Fourth Ave., Huntington, W. Va. Bids Apr. 24. CD 4/3.

▲† **A. B. Newton & Co.,** Vandalia, Ga., LB $1,016,865. 13 Junior Officers' Quarters and 67 married enlisted mens quarters, Naval Air Station, NBy-829, BRUNSWICK, GA. P. Wks. Office, Dpt. Navy, Naval Base, S. C. Bids Apr. 19. CD 3/26.

† **R. P. Farnsworth & Co.,** Box 850, New Orleans, La. LB $970,000. (3 bidders) bachelor officers' quarters, Joint Air Reserve Training Center, Alvin Callender Field, NOy 91253, NEW ORLEANS, LA. Eighth Naval Dist., U. S. Naval Station, Bldg. 16, (Algiers), New Orleans, La. Bids Apr. 24. CD 3/29.

▲ **Welsbach Corp.,** 1500 Walnut St., Phila., Pa. CA $1,374,857. water treatment plant, ASHLAND, KY. City, City Bldg., Ashland, Ky. CD 4/4, under LB.

▲† **Ruby Constr. Co.,** Madisonville, Ky. CA $1,733,341. est. $1,972,595. airport runways extens., taxi development paving, etc., Standiford Field, ENG-15-029-56-78, LOUISVILLE, KY. U. S. Eng., 830 W. Broadway, Louisville, Ky. Bids Apr. 20, awarded Apr. 27. CD 4/27, under LB.

BUILDINGS—LB & CA

▲ **Algernon Blair, Inc.,** First Natl. Bank Bldg., Montgomery, Ala., CA $2,625,982. low-rent HOUSING, 314 units, 32 residential bldgs., 3 misc. bldgs., NORFOLK, VA. Norfolk Redevelopment & Housing Auth., National Bank of Commerce Bldg., Norfolk, Va. Bids Mar. 15. CD 3/27, under LB.

▲ **Frank J. Rooney,** 5880 N.E. 4 Ave., Miami, Fla., CA, $1,037,787, Kenilworth HOUSE, 102 St. and Collins Ave., BAL HARBOUR VILLAGE, FLA. The Kenilworth Hotel, Inc., 10205 Collins Ave., Bal Harbour Village, Fla. Bids Apr. 17, awarded Apr. 26. CD 4/25, under LB.

▲ **Caldwell-Scott Eng. & Constr. Co., Inc.,** 340 S.E. 24 St., Fort Lauderdale, Fla., CA, $1,200,000. 90-unit APARTMENT "Fiesta Towers", Madeline Ave., FORT LAUDERDALE, FLA. Fiesta Development Co., c/o Charles F. McKirahan, archt., 2400 E. Oakland Blvd., Ft. Lauderdale, Fla. Bids Mar. 30. CD 4/10, under LB.

MIDDLE WEST

HEAVY CONSTRUCTION—BA

O., Cincinnati—BA 5/15—Bd. Comrs. Hamilton Co., Court House, extend concrete roadway from Westwood

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Northern Blvd. from North Bend to Harrison Ave., bridge at Race Rd. $820,000. Geo. Lemmel, co. engr. CD 11/5.

HEAVY CONSTRUCTION—LB & CA

▲ ILLINOIS—State Div. Hys., Springfield, Ill.—McCann Co. Inc., 2145 Devereaux Lane, Springfield, Ill., LB $139,579 (6 bidders) 7-span bridge over Little Wabash River except steel, Clay Co.; LB $256,328 (5 bidders) 5-span bridge over Macoupin Creek, Rt. 155 except steel, Green and Jersey Counties;
Ill.—Allied Structural Steel Co., 20 N.W. Wacker Dr., Chicago, Ill., LB $1,084,515 (2 bidders) steel for bridge over I. C. Burlington R.R. in Peru, La Salle Co.;
Ill.—General Paving Co., Inc., 30 E. John St., Champaign, Ill., LB $88,709 (4 bidders) 3-span bridge over Salt fork, Champaign Co.;
Ill.—Ben Harrison & Sons, 112 Keokuk St., Lincoln, Ill., LB $73,578 (3 bidders) 3-span bridge except steel over Fork Creek Rt. 665, Douglas Co.;
Ill.—Fred R. McKenzie, 405 Bondi St., Galesburg, Ill., LB $98,950 (2 bidders) culvert and 0.29 mi. paving, in Port Byron and bridge widening, Rock Island Co.;
Ill.—McElroy Co., Inc., Box 526, Macon, Ill., LB $133,412 (6 bidders) wid'n. bridge over Sangamon River, Rt. 48, Macon Co.;
Ill.—Mississippi Valley Structural Steel Co., 2100 E. Eldorado St., Decatur, Ill., LB $112,320 (5 bidders) steel for bridge over Macoupin Creek, Green and Jersey Counties;
Ill.—Rock Island Bridge, 1603 MiH St. Rock Island, Ill., LB $99,383 (4 bidders) test road steel for grade separation, Rte. 154, La Salle Co.;
Ill.—Stupp Bros. Bridge & Iron Co., 3800 Weber Rd., St. Louis, Mo., LB $183,085 (3 bidders) steel for bridge on Route 132 Madison Co. Bids Apr. 24. CD 4/16.

▲ ILLINOIS—State Div. Hys., Springfield,
Ill.—Standard Paving Co., 308 W. Washington St., Chicago, Ill., LB $848,605 (11 bidders) c. conc. 8.25 mi. Alt. Rte. 30, Lee Co.; LB $73,958 (6 bidders) grav. base course 1.2 mi. Rte. 1110, Kane Co.;
Ill.—McCann & Co., Inc., 2145 Devereaux Lane, Springfield, Ill., LB $376,583 (3 bidders) c. conc. 0.46 mi. Rte. 121, Macon Co.; LB $253,781 (1 bidder) c. conc., bit. 0.73 mi. Rte. 132, Madison Co.;
Ill.—Barber Paving Co., 4100 E. Logan St., Dectaur, Ill., LB $99,037 (5 bidders) conc. resurf. 1.79 mi. Ill. Rte. 34, Hardin Co.;
Ill.—Frank Feutz Co., Paris, Ill., LB $247,142 (4 bidders) resurf Rte. 15, Wahne Co.;
Ill.—Gund Graham Co., State Bank Bldg., Freeport, Ill., LB $125,290 (1 bidder) c. conc. 0.13 mi. U.S. Rte. 20, Jo Daviess Co.;
Ill.—Henry County Constr. Co., Cambridge, Ill., LB $110,055 (2 bidders) 6.15 mi. Rte. 229, Henry Co.;
Ill.—Hoeffken Bros., Inc., 222 W. B St., Belleville, Ill., LB $1,580,340 (5 bidders) paving 8 mi. Rte. 15, Wayne Co.;
Ill.—J. P. Hoeferich Co., P. O. Box 391, La Salle, Ill., LB $209,370 (5 bidders) grav. surf. and bridge 8.67 mi. Rte. 260, La Salle Co.;
Ill.—I. D. Lain & Co., 1901 E. Jackson St., Springfield, Ill., LB $431,322 (3 bidders) c. conc. 0.66 mi., c. conc., 1.47 mi. Rt. 88, Peoria Co.;
Ill.—McCalman Constr. Co., 619 Sector St., Danville, Ill., LB $594,470 (2 bidders) bit. conc. resurf. 10.07 mi. wid'n. 8.56 mi. embankment 0.36 mi. N.S. 150, Vermilion Co.;
Ill.—Maclair Asphalt Co., 6000 Collinsville Rd., East St. Louis, Ill., LB $167,927 (7 bidders) b. conc. resurf., patching 11.65 mi. Rte. 13, Williamson, Saline and Gallatin Counties;
Ill.—Mautz & Oren, Inc., Effingham, Ill., LB $82,372 (2 bidders) bit. surf. 0.39 mi. U. S. Rte. 40, Effingham Co.;
Ill.—Producers Mining Co., 605 N. Granite St., Marion, Ill., LB $125,878 (3 bidders) bit. surf. 4.25 mi. Rte. 886, White Co.;
Ill.—Rock-Road Constr. Co., 5915 Rodgers Ave., Chicago, Ill., LB $112,500 (4 bidders) b. conc. resurf. 4.92 mi. Ill. Rte. 53, Cook Co.;
Ill.—Sangamo Constr. Co., 700 N. MacArthur St., Springfield, Ill., LB $82,489 (2 bidders) b. conc. resurf. 3.9 mi. Rte. 4, Sangamon Co.;
Ill.—Sankey Bros., Illinois Bldg., Springfield, Ill., LB $128,789 (2 bidders) b. conc. resurf. 5.22 mi. U. S. Rte. 67, near Virginia;
Ill.—S. S. Viland Constr. Co., 627 E. Jackson St., Morris, Ill., LB $115,260 (6 bidders) grav. or crushed stone 4.51 mi. Rte. 172, De Kalb Co.;
Ill.—Zimmerly Constr. Co., Marshall St., Paris, Ill., LB $105,029 (5 bidders) bit. surf. 3 mi. Rte. 677, Edgar Co. Bids Apr. 24. CD 4/16.

▲ American Bridge Div., U. S. Steel Corp., 525 W. Wm. Penn Pl., Pittsburgh, Pa.; LB $6,800,000 superstructure high-level cantilever bridge over Calumet River, CHICAGO, ILL. City, City Hall, Chicago, Ill. Bids Apr. 23.

BUILDINGS—LB & CA

▲ Taborn Co., 10526 St. Clair Ave., Cleveland 8, O. Own Forces. Est. $2,600,000. 175 HOMES, Lee Rd. at E. 173 and 174 Sts.; Robindal and E. 296 and 298 Sts., Mt. Pleasant area and Hirst, Emery, Brookfield and Guardian Aves., CLEVELAND, O. Robert F. Madison, 1335 E. 105 St., Cleveland, O., archt.

▲ Marvin Helf, 10001 Carnegie Ave., Cleveland 6, O. Own Forces. $1,500,000. 100 ranch type HOMES, Lost Nation Rd. near Rte. 283, EASTLAKE, O. Louis J. Rotman, 3171 Vine St., Wickliffe, O., archt.

▲ Inman Constr. Co., 2900 W. Jefferson St., Louisville, Ky., CA, $1,150,000. Miracle Mile SHOPPING

Architect: Gibbs & Hill, Inc.
Gen. Contr.: Robert H. Pinnix Construction Co.
Glazing Contr.: Binswanger & Co.

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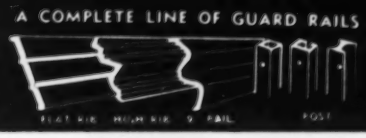
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Hammond, Ind. Houston, Tex. Jacksonville, Fla.

CENTER and paving, CLARKSVILLE, IND. Miracle Mile Shopping Center, 1701 W. Burnett St., Louisville, Ky. Bids Mar. 15, awarded Apr. 19. CD 2/22, under LB.

▲ W. A. Sheets & Son, 1057 Osage St., Fort Wayne, Ind.; CA, $1,095,190, general contract Consolidated HIGH SCHOOL, NORTH MANCHESTER, IND. North Manchester-Chester Twp. School Corp., North Manchester, Ind. Bids Apr. 25. CD 4/3.

▲ Holmes Constr. Co., Palmer St., Wooster, O., CA, $1,500,000, steel M. L. and WAREHOUSE, 116 St. and Burley Ave., CHICAGO, ILL. Republic Steel Corp., Republic Bldg., Cleveland, O.

Sorenson-Gross Constr. Co., Flint, Mich. CA $848,000, general constr. HIGH SCHOOL, MILFORD, MICH. Bd. Educ., Huron Valley School Dist., Harold Hansen, supt., Milford, Mich. CD 4/23, under LB.

▲ B. E. Taylor, Inc., 26012 Fenkell St., Redford, Mich. Owner Builds, $1,250,000. Kingsboro Manor, brick ranch HOMES, Minock, Beech and Schoolcraft Rds., REDFORD, MICH.

WEST OF MISSISSIPPI

HEAVY CONSTRUCTION—LB & CA

▲ TEXAS—Texas Turnpike Auth., 214 First Federal Savings Bldg., Austin, Zone 1, Flenniken Constr. Co. & L. H. Lacy Co., P. O. Box 634, Shreveport, La., CA $2,599,344, paving 7.96 mi. from approx. 1.1 mi. east of Watson School Rd. to approx. 0.1 mi. east o. Chalk Hill Rd., Proj. D-FW 48, Tarrant and Dallas Counties. Bids Apr. 17, awarded Apr. 25. CD 4/23, under LB.

† M. R. Nelson Co., 2115 W. Beaumont Ave., McAllen, Tex., CA $999,561, constr. A. C. & W. Station, ENG-38, ZAPATA, TEX. U. S. Eng., Box 1229, Galveston, Tex. Bids Feb. 15, awarded Apr. 4. CD 2/21, under LB.

▲ Colorado Constructers, A. S. Horner & Brosa & Root, 725 W. 39 Ave., Denver, Colo., LB $1,590,743, est. $1,500,000 lining Moffat Water Tunnel, DENVER, COLO. Bd. Water Comrs., City & County Bldg., Denver, Colo. Bids Apr. 26. CD 4/6.

BUILDINGS—LB & CA

▲ King Constr. Co., Box 39, Texarkana, Tex., CA $1,050,184, Fulton Street SENIOR HIGH SCHOOL, DENTON, TEX. Denton Independent School Dist., Denton, Tex. Bids Apr. 17. CD 4/25, under LB.

▲ Spartan Constr. Co., Box 14397, Houston, Tex. CA $1,298,455, est. $1,100,000, JUNIOR HIGH SCHOOL, SPRING BRANCH, TEX. Spring Branch Independent School Dist., Spring Branch, Tex. Bids Apr. 11. CD 4/23, under LB.

▲ McNeil Constr. Co., 5858 Wilshire Blvd., Los Angeles, Calif., CA Est. $3,000,000, modernization Canyon Village, Yellowstone National Park, incl. 2 story administration, motels, lodge and recreation hall, employees dormitories, WYOMING. Yellowstone Park Co., Yellowstone, Wyo. Welton Becket & Assoc., 5657 Wilshire Blvd.; Los Angeles, Calif., archts.

FAR WEST

BUILDINGS—BA

▲ Wash., Seattle—SCHOOL—BA 5/22—School Dist. 1, 815 Fourth Ave. N., rein.-con. Jefferson Park Junior High School, 16 Ave. S and Columbia Way. $1,350,000. Plans deposit $50. J. W. Maloney, Central Bldg., archt. CD—3/15/54.

▲ Calif., Covina—SCHOOL—BA 5/23—Covina Union High School Dist., Covina, 122,000 sq. ft., frame, stucco West Covina High School, West Covina. $2,500,000. Kistner, Wright & Wright, 816 W. 5 St., Los Angeles, archts. CD 2/9.

▲ Calif., San Jose—COUNTY JAIL—BA 5/24—Santa Clara Co., Court House, 4 story, rein.-con. county jail bldg. $1,000,000. Frank Treseder, 390 Park Ave., Zone 20, archt. CD 2/9.

▲ Ore., Astoria—HIGH SCHOOL—BA 5/25—Astoria School Dist., Astoria, 6 building high school. $1,000,000. Extended date. Stewart & Richardson, 219 S.W. Stark St., Portland, and E. E. Isaacson, Astoria, archts. CD 2/28.

▲ Calif., San Jose—CITY HALL—BA 5/28—City, City Hall, 4 story rein.-con. city hall, $1,750,000. Donald F. Haines, 320 Market St., San Francisco, archt. CD 10/10.

HEAVY CONSTRUCTION—LB & CA

▲ CALIFORNIA—State Div. Hys., 1120 N St., Sacramento, Calif.—Norman E. Fadel, Inc., P. O. Box 206, North Hollywood, Calif., LB $886,663, (2 bidders) grading 4-lane divided freeway, U.S. 101 Humboldt Co., Calif.—Gordon H. Ball, Danville, Calif., LB $1,485,159, (3 bidders) grading, paving 5.7 mi. U.S. 99 and 4 bridges Tulare Co. Bids Apr. 25. CD 4/13.

▲† Peter Kiewit Sons' Co., 345 Kieways Ave., Arcadia, Calif. LB $1,995,005, constr. channel imprvs. California Arcadia Wash, Lima St. Branch, channel debris basin, Sierra Madre-Arcadia District, CIVENG-04-353-56-48, CALIFORNIA. U. S. Eng., 751 S. Figueroa St., Los Angeles, Calif. Bids Apr. 26. CD 4/4.

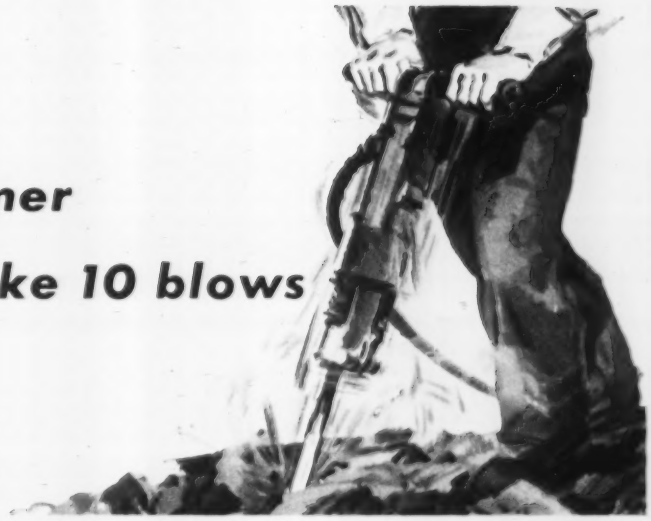
† San Francisco Bridge Co., 140 New Montgomery St., San Francisco, Calif., CA, $908,765, dredging at Richmond Harbor, Richmond, Contra Costa Co. CIVENG-56-64, CALIFORNIA. U. S. Eng., 180 New Montgomery St., San Francisco, Calif. Awarded Apr. 24. CD 4/19, under LB.

▲ Arundel Corp., 1755 N. Sierra Bonita, Los Angeles, L. E. Dixon Co., 409 S. California St., San Gabriel,

(Continued on page 96)

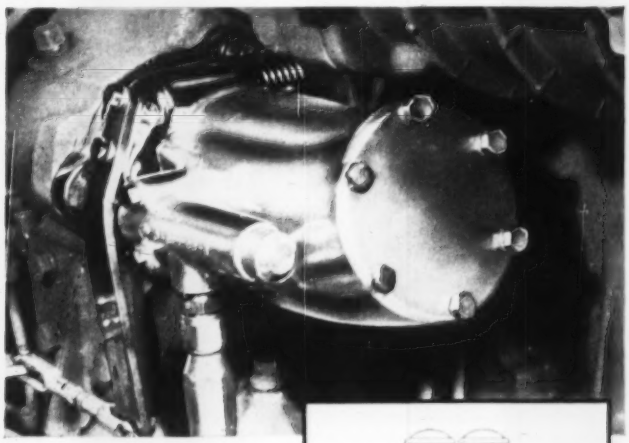
It takes a jackhammer

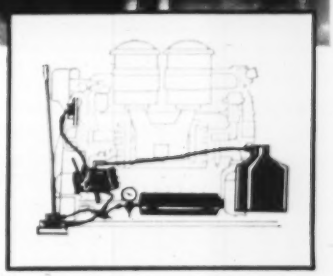
3/10 seconds to strike 10 blows



But a Hydrostarter starts a Detroit Diesel in

Only Half the Time





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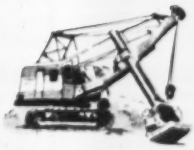

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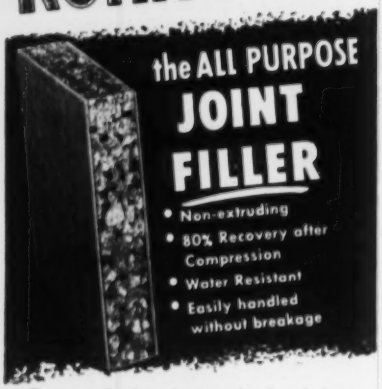

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(Continued from page 94)

and Kemper Constr. Co., 3701 Overland St., Los Angeles, Calif., LB $5,946,566, est. $3,000,000. North Central Outfall Sewer, Unit 1, Sections B through G, LOS ANGELES, CALIF. City, City Hall, Los Angeles, Calif. Bids Apr. 25. CD 4/3.

N. P. Valkenberg, 8609 San Vicente Ave., South Gate, Calif., CA, $946,983, sanitary sewers, Cross Town Trunk Sanitary Sewer, SANTA ROSA, CALIF. City, City Hall, Santa Rosa, Calif. Bids Apr. 12, awarded Apr. 19. CD 4/19, under LB.

BUILDINGS—LB & CA

▲ Utah Constr. Co., 100 Bush St., San Francisco, Calif., CA, $5,000,000, design and construct CHEMICAL PLANT, CHANDLER, ARIZ. Southwestern Agro-chemicals Corp., 802 N. 1 Ave., Phoenix, Ariz.

▲ Ross B. Hammond Co., Box 3901, Portland, Ore., CA $1,104,597, BIOLOGICAL and AGRICULTURAL BLDG., incl. utility tunnel; CA $1,446,798, two men's DORMITORIES and CAFETERIA, Oregon State College, CORVALLIS, ORE. State Bd. Higher Educ., University of Oregon, Eugene, Ore. Bids Apr. 20, awarded Apr. 24. CD 4/26, under LB.

▲ H. George & Sons, Hutton Bldg., Spokane, Wash., CA, $1,000,000, pea processing PLANT, SPOKANE, WASH. Inland Empire Pea Growers' Assn., Oakesdale, Wash. CD 3/29.

▲ Tumblin Co., 2901 "H" St., Bakersfield, Calif., CA, $2,813,000 (4 bidders) Southside High SCHOOL, BAKERSFIELD, CALIF. Kern Co. Joint Unified High School Dist., 2200 24 St., Bakersfield, Calif. Bids Apr. 23. CD 3/22.

▲ Southwestern Eng. Co., 4800 S. Santa Fe St., Vernon, Calif., CA, $2,750,000, design and construct 10,000 bbl. per day UNIFINER and HIGH OCTANE GASOLINE PLATFORMER (first unit) NORWALK, CALIF. Wilshire Oil Co. of California, Norwalk, Calif.

▲† M. H. Golden Constr. Co., 3485 Noel St., San Diego, Calif., CA $1,884,600, Fleet Sonar SCHOOL permanent bldg., NOy 90795, Spec. 49472, SAN DIEGO, CALIF. Eleventh Naval Dist., San Diego, Calif. Bids Apr. 12, awarded Apr. 20. CD 3/14.

CANADA

HEAVY CONSTRUCTION—BA

▲ Quebec—BA 5/17—St. Lawrence Seaway Auth., No. 2 Temporary Bldg., Ottawa, Ont., excavation of channel from Station 930 plus 00 to Station 1045 plus 00 and constr. dyke from Station 930 plus 00 to Lake St. Louis, part of St. Lawrence Project. CD 9/9/54.

BUILDINGS—BA

▲ Man., Winnipeg—OFFICE—BA 5/15—Investors Syndicate of Canada Ltd., 345 Donald Ave., office, Broadway Ave. and Smith St. $1,000,000. Moody & Moore, 295 Broadway Ave., archts. CD 10/4.

BUILDINGS—SLC

▲ Ont., Toronto—OFFICE—Regent Refining (Canada) Ltd., 184 Bay St., soon lets contract 7 story, 48,000 sq. ft., rein.-con., brick office bldg. $2,000,000. Marani & Morris, 1250 Bay St., archts. Wallace, Carruthers & Assocs., 92 Yorkville Ave., engrs.

HEAVY CONSTRUCTION—LB & CA

▲ Hill-Clark-Francis Ltd., 190 Pine St. S., Timmins, Ont. CA, over $1,000,000 two radar BASES addns. COCHRANE, ONT. Defense Constr. (1951) Ltd., 56 Lyon St., Ottawa, Ont. Bell Telephone Co. of Canada, 1015 Beaver Hall Hill, Montreal, Que., project coordinator. Awarded Apr. 20.

▲ S. McNally & Sons Ltd., 2200 King St. E., Hamilton, Ont. CA, $1,580,740. (6 bidders) storm and sanitary sewers, Contr. No. 1, HAMILTON, ONT. City, City Hall, Hamilton, Ont. Bids Apr. 18. CD 3/28.

▲ Atlas Constr. Co. Ltd., 4781 St. Catherine St. W., Montreal, Que. CA, $2,649,200. Filter Gallery No. 5, MONTREAL, QUE. City, City Hall, Montreal, Que. Bids Mar. 19, awarded Apr. 10. CD 3/26, under LB.

▲ Dibblee Constr. Co. Ltd., 384 Bank St., Ottawa, Ont. CA, $1,572,112. roadwork, landscaping, sewers and water mains, etc., Army Camp, PETAWAWA, ONT. Defense Constr. Ltd., 56 Lyon St., Ottawa, Ont. Bids Apr. 17. CD 4/3.

▲ Gulf Maritime Constr. Ltd., 52 Soucy St., Matane, Que. CA, $1,131,900. wharf constr., PORTNEUF, QUE. Dpt. P. Wks., Hunter Bldg., Ottawa, Ont. Bids Feb. 29. CD 3/7, under LB.

BUILDINGS—LB & CA

Newman Brothers Ltd., Box 193, St. Catherines, Ont., CA, $900,000 (8 bidders) 225-bed HOME FOR AGED, Twelve Mile Creek, ST. CATHARINES, ONT. St. Catharines and Lincoln County Home for the Aged, c/o Macbeth & Williams, archts., 104 Queen St., St. Catharines, Ont. Bids Mar. 20. CD 3/5.

▲ Anglin-Norcross', Ontario Ltd., 224 Davenport Rd., Toronto, Ont., CA, $3,724,800 (25 bidders) 14 blocks of low-rental APARTMENT HOUSING, incl. 426 units, Bathurst-Lawrence Area, TORONTO, ONT. Ontario Dpt. Planning & Development, Queen's Park, Toronto, Ont., Central Mortgage & Housing Corp., 56 Lyon St., Ottawa, Ont., Municipality of Metropolitan Toronto, 67 Adelaide St. E., Toronto, Ont., Fleury & Arthur, 85A Bedford Rd., Gordon S. Adamson & Assocs., 52 St. Clair Ave. E., Deacon & Arnett, 1016 Eglinton Ave. E., and W. J. McBain, 10 Asquith Ave., all Toronto, Ont., archts. Awarded Apr. 24. CD 7/6/54.

▲ Wilfrid Legare, Inc., 375 Ste. Foy Rd., Ste. Foy, Que. Owner Builds, $1,500,000. 75 unit HOUSING DEVELOPMENT, STE. FOY, QUE.

(Continued on page 98)

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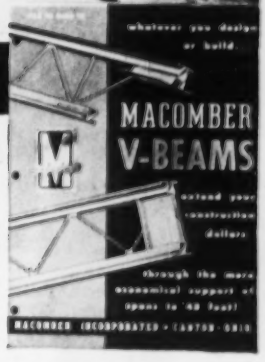

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STRUCTURALS

(Continued from page 96)

▲ Joseph Turcotte Constr., 438 Allard St., Ste. Foy, Que., CA, $1,070,000. SCHOOL, south side of Ste. Foy Rd., STE. FOY, QUE. School Comn. of Ste. Foy, Ste. Foy, Que. Bids Apr. 13.

▲ Joseph Turcotte Constr., 438 Allard St., Ste. Foy, Que., CA, $1,070,000. SCHOOL, north side of Ste. Foy Rd., STE. FOY, QUE. School Comn. Ste. Foy, Que. Bids Apr. 13.

▲ J. S. Hewson Ltd., 4424 St. Catherine St. W., Montreal, Que., CA, $1,000,000. sodium silicate PLANT, VALLEYFIELD, QUE. National Silicates Ltd., 28 St., New Toronto, Ont. Bids Apr. 16. CD 4/9.

ALASKA

HEAVY CONSTRUCTION—BA

▲† Alaska SHOP BA 5/22—U. S. Eng., 4735 E. Marginal Way, Seattle, Wash., maintenance shop at Elelson Air Force Base, and store house, Ladd Air Force Base, Inv. 56-40; $1,000,000. CD 8/22.

BUILDINGS—BA

▲† Alaska, Fort Richardson COMMUNITY CENTER BA 5/23—U. S. Eng., Anchorage, community center, Inv. 56-37, $1,000,000. CD 8/22.

BUILDINGS—LB & CA

▲† Denali Eng. Co., Juneau, Alaska, LB $1,794,593 (6 bidders); HIGH SCHOOL, JUNEAU, ALASKA. Alaska P. Wks., Dpt. Interior, Box 1181, Juneau, Alaska. Bids Apr. 25. CD 4/17.

LATIN AMERICA

HEAVY CONSTRUCTION—BA

▲† COSTA RICA BA 6/1—Bureau P. Rds., Dpt. Commerce, Inter-American Hy., 18 and F Sts. N.W. Wash. 25, D. C., U. S. A.,
Proj. 75-56-4, approx. 56 mi. by constr., incl. 1 major bridge, Platanares to Ballast Pit. CD 4/18.

HEAVY CONSTRUCTION—LB & CA

▲† NICARAGUA Bureau P. Rds. Dpt. Commerce, Office of the Inter-American Hy. Office, General Services Bldg., Wash 25, D. C., U. S. A.,
Nello L. Teer Co., P. O. Box 1131 Durham, N. C., U. S. A. CA $1,301,791, grading, drainage, 4 bridges, etc. from Muhan approx. 23 mi. east of Santo Tomas and extending [illegible]y toward Rama, approx. 15 mi. Proj. R-3A. Bids Apr. 12. CD 4/17, under LB.

AMERICANS ABROAD

HEAVY CONSTRUCTION—BA

▲ Bids are being taken on the following project under international competitive bidding of NATO.

FRANCE

Secretariat d'Etat a l'Industrie et au Commerce, Service Special des Depots d'Hydrocarbures, 85 Boulevard Montparnasse, Paris, supply and installation of the French part of Metz-Bitburg pipe line; $1,530,000. Firms interested in bidding should apply for invitation to bid before May 8. Deadline for submitting bids to the supply of pipes will be 3 weeks after issuance of formal request for bids, and for the installation of pipes, 6 weeks after such issuance.

PROPOSED PROJECTS

WATER SUPPLY

▲ Mont., Bozeman—City, $1,500,000 bond election May 29, expand and imprv. water supply, new pipe line from Hyline reservoir, settling basin, supply line from basin, 4 m. g. covered reservoir. Morrison & Malerle, Inc., Helena, consult. engr. CD 11/7.

▲ Va., Fairfax—Town, Court House, transmission mains, $2,270,000; pumping station, $150,000; constr. dam in Loudon County, $300,000; raw water pumping station, $150,000; filter plants, $900,000. Alvord, Burdick & Howson, 20 N. Wacker Dr., Chicago, Ill., consult. engrs. Will probably start bidding in July 1956. CD 4/10.

SEWERS, WASTE DISPOSAL

▲ Ala., Montgomery—City, City Hall, $2,270,000 bond election May 29, storm water drainage, 11 projects, CD 6/24/53.

▲ Calif., Lancaster—Sanitary Distr. No. 14, Lancaster, voted $2,377,000 bonds, Apr. 10, enlarging sanitary facilities. CD 3/1.

▲ Conn., Naugatuck—Borough, Borough Hall, storm water drainage imprv. of existing sys. flood control $1,750,000.

▲ Ill., Springfield—City, City Hall, sewerage sys., incl. enlarging sewage plant, $3,200,000. Jenkins, Merchant & Nankivil, 805 E. Miller St., and Crawford, Murphy & Tilly, 755 S. Grand St., consult. engrs. CD 4/18.

▲ La., Westwego—City, sewerage sys. $2,131,481. Herz Engineers, 816 Howard Ave., New Orleans, engrs. CD 5/16/51.

▲ N. J., Plainfield—City, City Hall, South Side relief sanitary sewer to connect with treatment plant in Borough of Middlesex. $1,125,000. Elson Killam, Millburn, consult.-engr. James A. Fleming, City Hall, city engr.

▲ Pa., Reading—City, City Hall, imprv. sewerage sys. $4,500,000. CD 8/2/45.

▲ Wis., Wauwatosa—City, City Hall, sewer constr. for 1956, $1,000,000. F. Kirchuck, city engr.

BRIDGES

▲ Ill., Chicago—Cook Co., County Bldg., Northwest Expressway bridge over North Branch Chicago River, Ohio Ontario Sts. with North, West and South Expressway, $4,800,000. Suhr, Berryman, Peterson & Suhr, 130 N. Wells St., Chicago, Ill., consult. engrs. (Correction—name of engineers). CD 4/6.

▲ Pa., Harrisburg—City, City Hall, repairing Mulberry Street Bridge. $1,000,000. Modjeski & Masters, State Street Bldg., Harrisburg, consult. engrs. Bids late Summer.

STREETS AND ROADS

▲ Calif., San Francisco—City, Dpt. P. Wks., City Hall, San Francisco, Upper Market St. on east slope of Twin Peaks, widening, realigning, imprv. between Hattie St. and Portola Dr., 1.25 mi. $2,500,000. Bids in May. CD 9/1.

▲ PA., Scranton—City, City Hall, voted $2,500,000 bonds, street repairs, bridges and traffic control.

EARTHWORK, WATERWAYS

▲† Colorado, New Mexico, Utah and Wyoming—Bureau of Reclamation, Dpt. Interior, Bldg. 1A, Denver Federal Center, Denver, Colo.
COLORADO RIVER STORAGE PROJECT
Glen Canyon Dam, 700 ft. high concrete with 26,000,000 acre ft. reservoir, 800,000 kw. power plant on Colorado River, Utah.

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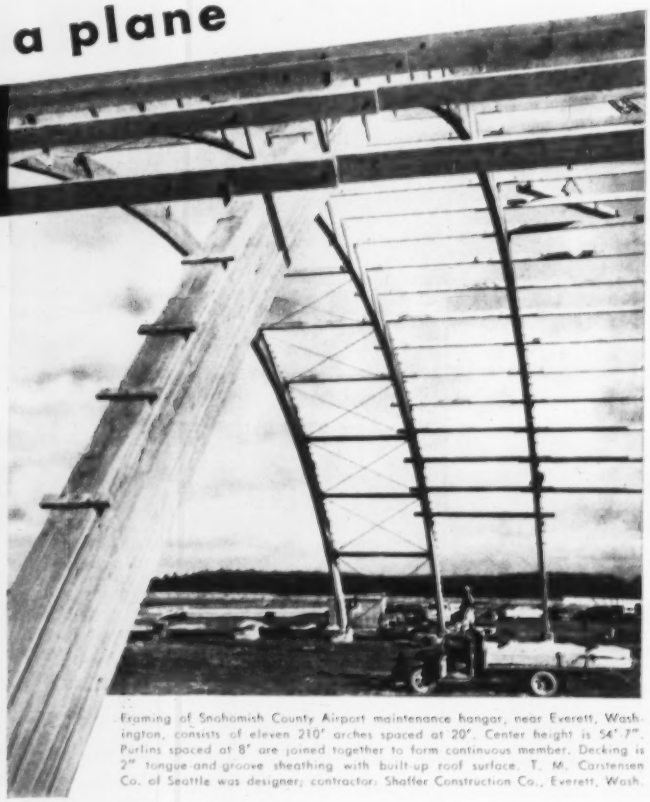

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Framing of Snohomish County Airport maintenance hangar, near Everett, Washington, consists of eleven 210' arches spaced at 20'. Center height is 54'-7". Purlins spaced at 8' are joined together to form continuous member. Decking is 2" tongue-and-groove sheathing with built-up roof surface. T. M. Carstensen Co. of Seattle was designer; contractor: Shaffer Construction Co., Everett, Wash.

Flaming Gorge Dam, 400 ft. high, 4,000,000 acre ft. reservoir, 72,000 kw. power plant, on Green River, 30 mi. north of Vernal, Utah.

Navajo Reservoir Storage unit, incl. 335 ft. high dam, 1,500,000 acre ft. reservoir, 34 mi. east of Farmington, N. M.

Curecanti storage unit, 4 dams and reservoirs on Gunnison River, Gunnison, Colo. $760,000,000, authorized (no appropriation. Asking $8,000,000 1957).

▲ **Montana**—Montana Power Co., 40 E. Broadway, Butte, Cochrane Power Development, Missouri River between Ryan and Rainbow Developments, incl. gravity dam creating 27,700 acre ft. storage, power house with two 42,000 hp. turbines connect with 25,000 kw. generators. $15,000,000. Federal Power Commission issued license.

▲ **Texas**—Lower Colorado River Auth., 3700 Lake Austin Blvd., Austin, water storage dams for power generating and flood control at Columbus, $9,500,000; near LaGrange, $7,000,000; water storage dam for irrigation purposes, at Altair, $6,500,000, on Colorado River. CD 7/30/43.

LATIN AMERICA

▲ **Argentina**—Yaciminentos Petroleos Fiscales (State Enterprises) Buenos Aires, petroleum development incl. gas pipe line from Campo Duranto Buenos Aires, $76,000,000; from Campo Duran to San Lorenzo, $24,000,000; and from Mendoza to San Lorenzo, $19,000,000; refining plant at Campo Duran, enlarging of Luja DeCuyo Refinery, $15,000,000; greater Buenos Aires zone refinery, $18,000,000; lubricants plant, $4,000,000. storage and fuel distr. plant, $5,000,000; oil drilling and other equip., $76,000,000. Work to start about July 1.

▲ **Mexico, Monterrey**—State Govt., Palacio del Estado, Monterrey, plans WW, $3,200,000. CD 2/3/55.

AMERICANS ABROAD

▲ **Thailand, Bangkok**—HOTEL—Hilton Hotels International, Waldorf-Astoria, New York 22, N. Y., U. S. A., plans hotel. $4,000,000.

PUBLIC BUILDINGS

▲ **Ala., Montgomery**—LIBRARY, etc.—City, City Hall, $1,000,000 bond election May 29, public library and museum.

▲ **Ariz., Phoenix**—HIGHWAY ADMINISTRATION OFFICE—State Hy. Dpt., 1739 W. Jackson St., Phoenix, plans by J. Harold McDowell & Fred M. Guiney, 506 E. Camelback Rd., highway department administration bldg., $1,261,500. J. S. Mills & E. W. McIntire, State Hy. Dpt., engrs.

▲ **Calif., Agnes**—HOSPITAL BUILDINGS—State Div. Architecture, 1120 N. St., Sacramento, food service bldg., east area, $1,118,000; laundry expansion, $266,650; remodeling original food service bldg., west area, $455,150, Agnew State Hospital. Funds available July 1. CD 10/26/54.

▲ **Calif., Berkeley**—ADMINISTRATION OFFICE, etc.—University of California, Administration Bldg., administrative office, and Giannini Hall alterations, $2,664,000; life sciences bldg., alterations, remodeling $1,206,625; service bldgs., $801,700, Berkeley Campus.

▲ **Calif., Costa Mesa**—WARD, etc.—State Div. Architecture, 1120 N St., Sacramento, 2 ward bldgs., $2,334,300; developing recreation field for school $87,000; covered passages to link buildings, $249,000; school, phase 1, $484,540; garage and maintenance shops, $102,100; 2 security wards, $825,050, Fairview State Hospital. Funds available July 1.

▲ **Calif., Long Beach**—COLLEGE—State Div. Architecture, 1120 N St., Sacramento, library addn. $1,500,000; fine arts bldg., $606,800; science bldg. addn., $2,614,500; swimming pool $135,050, Long Beach State College. Funds available July 1.

▲ **Calif., Norwalk**—WARD, etc.—State Div. Architecture, 1120 N St., Sacramento, ward bldgs., $2,281,700; water development $64,900, Metropolitan State Hospital. Funds available July 1.

▲ **Calif., Pomona**—ENGINEERING, etc.—State Div. Architecture, 1120 N. St. Sacramento, engineering bldg., $2,210,900; laundry bldg. $1,047,900; animal husbandry, production units, $514,600; site development, $574,000, Kellogg-Voorhis Campus, Calif. State Polytechnic College. Funds available July 1.

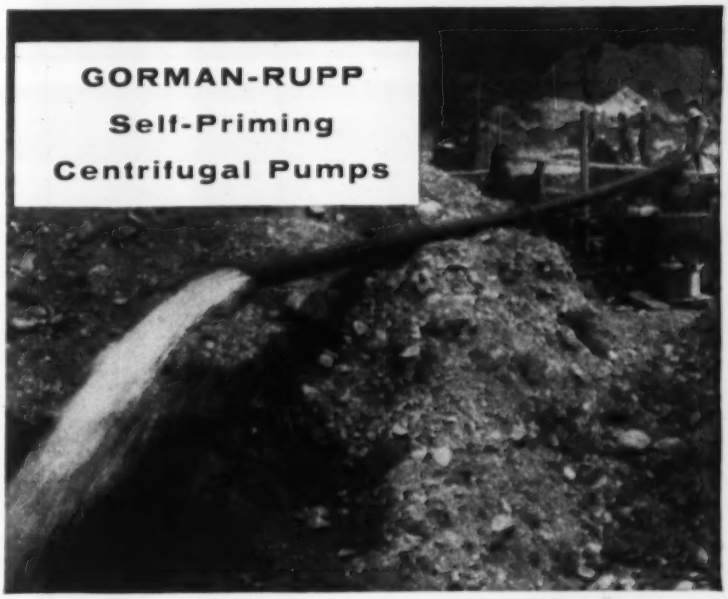
▲ **Calif., Ramona**—STATE COLLEGE—State Div. Architecture, 1120 N. St., Sacramento, speech-drama bldg., $1,261,400; industrial arts bldg., $2,659,300; fine arts bldg., $1,086,900; science bldg., $2,756,800; library bldg., $1,530,950; music bldg., $2,087,700; site development, $1,000,000, Los Angeles State College of Applied Arts & Sciences, Ramona Campus. Funds available July 1.

▲ **Calif., Riverside**—HOSPITAL—Riverside Co., Court House, plans by Herman G. Ruhnarn, Mission Inn, Riverside, country hospital addns., incl. 3 buildings. $2,400,000.

▲ **Calif., Sacramento**—LIBRARY ADDN., etc.—State Div. Architecture, 1120 N St., Sacramento, library addn., $1,000,000; corporation yard, $205,650, at Sacramento State College, State Dpt. Educ. Funds available July 1.

▲ **Calif., San Diego**—LIBRARY—State Div. Architecture, 1120 N St., Sacramento, library addn. San Diego State College, $1,680,750. Funds available July 1.

▲ **Calif., San Francisco**—LIBRARY—State Div. Architecture, 1120 N. St., Sacramento, library addn.,



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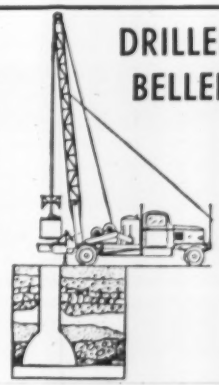

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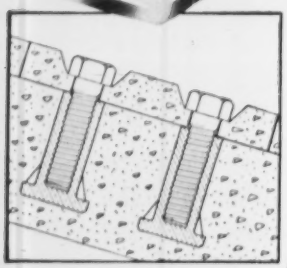

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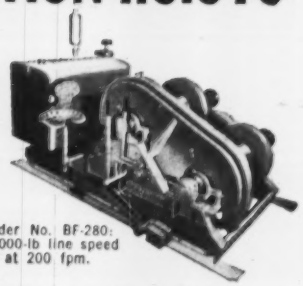

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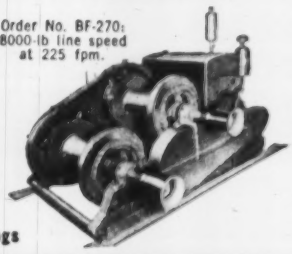

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San Francisco State College, $1,677,650. Funds available July 1.

▲ Calif., Santa Barbara—FINE ARTS, etc.—University of California, Administration Bldg., Berkeley, fine and applied arts bldg., $2,492,220; physical education bldg., $1,768,400, Santa Barbara Campus.

▲ Ind., Muncie—RESIDENCE HALL, etc.—Ball State Teachers College Bd., State of Indiana, Muncie, plans by Walter Scholer & Assocs., 1114 State St., Lafayette, 3 story, rein.-con., masonry Residence Hall for Men, $1,000,000; 3 story, rein.-con., steel, masonry Music Section Auditorium, $700,000.

▲ Mass., Lakeville—SCHOOL—Towns of Lakeville, Rochester, Berkley and Freetown, regional high school, $2,200,000.

▲ Mich., Dearborn—YOUTH CENTER—City, Myron A. Stevens, clk., youth center, $1,000,000. CD 11/9/54.

▲ Mo., St. Louis—OFFICES—St. Louis Area Support Center, 22 and Spruce Sts., Zone 2, conversion of former U. S. Medical Depot warehouse into offices for governmental agencies, $3,346,000.

▲ N. J., East Orange—SCHOOLS—Bd. Educ., 19 Winans St., plans by Emil Schmidlin, Central Ave., constr. Clifford Scott High School addn. $1,630,000; new school, Stockton School Annex, $825,000, bids in October or November; North Wing to Elmwood School, $1,500,000.

▲ N. J., Middletown—SCHOOL—Bd. Educ., Middletown, plans by Fred Elsasser, 2013 Morris Ave., Union, high school, $2,000,000.

▲ N. J., Newark—SCHOOL—City Bd. Educ., Admin. Bldg., 31 Green St., plans by William E. Lehman, 972 Broad St., 2 story, bsmt., 124,000 sq. ft. McKinley School, $2,300,000-$2,500,000.

▲ N. Y., Bellmore—SCHOOLS—Mepham High School Bd., Camp Ave., Junior High School, Grand Ave. and Newbridge Rd., $3,360,000; high school, Camp Ave. and Meadowbrook Rd., $4,000,000. Referendum vote in June.

▲ O., Lebanon—SECURITY PRISON—Ohio State Dot. Mental Hygiene & Correction, Dr. John D. Porterfield, dir., State Office Bldg., S. Front St., Columbus, plans by Bellman, Gillett & Richards, 528 Jefferson St., Toledo, Medium Security Prision to be built in 3 stages. $11,000,000. First stage, incl. administration bldg., hospital, kitchen and dining areas, segregation bldg., custodial bldg. and laundry, est. $3,900,000. Bids in 1957. CD 1/12.

▲ Tex., Amarillo—HIGH SCHOOL—Amarillo Independent School Dist., 508 Johnson St., plans by Robert Hucker, Johnson Bldg., high school, $1,000,000. Earl W. Parge, Johnson Bldg., assoc. archt. CD 9/30.

▲ Tex., Austin—HIGH SCHOOL—Austin Independent School Dist., 701 E. 11 St., plans by C. H. Page & Son, 1st. Federal Bldg., Junior High School, $1,250,000.

▲ Tex., Beaumont—SCHOOLS—Beaumont Independent School Dist., 650 College St., bond election May 19, Junior High School, $2,250,000; group school addns., repairing, $800,000; second Junior High School, $2,750,000; Elementary School No. 1, $500,000; Elementary School No. 2, $500,000; Elementary School No. 3, $500,000; Elementary School No. 4, $500,000. CD 1/6/54.

▲ Tex., Brazosport—SCHOOLS—Brazosport Independent School Dist., Brazosport, plans by Emory S. White, M & M Bldg., and Arne D. Engberg, 2130 Welch St., Houston, Senior High School, $500,000; Junior High School, $1,000,000; Junior High School, $600,000; Junior High School unit, $400,000. CD 4/17.

▲ Wash., Vancouver—JUNIOR COLLEGE—School Bd., Vancouver, $500,000 bond election May 8, 6 Junior College Bldgs. $1,366,700. McCoy & Bradbury, Vancouver, archts.

COMMERCIAL BUILDINGS

▲ Ala., Camp Rucker—HOUSING—U. S. Eng., 2301 Grant St., Mobile, Ala., plans by Pearson, Tittle & Narrows, First National Bank Bldg., Montgomery, construct and finance 120 housing units. $1,620,000. Bids in about 45 days.

▲ Ark., Hot Springs—HOTEL—Owners, c/o J. N. McCammon, archt., Meadows Bldg., Dallas, Tex., 250- to 300-room masonry hotel, $1,000,000-$3,000,000. CD 5/16/45.

▲ Calif., Anaheim—DWELLINGS—Van Druff Development Co., 8021 Rome Ave., 120 frame, stucco dwellings, Tract 2875, and 62 frame, stucco dwellings, Tract 2876, $1,750,000.

▲ Calif., Canoga Park—DWELLINGS—Inca Homes, 9838 E. Belmont Ave., Bellflower, 340 frame, stucco dwellings. $3,700,000.

▲ Calif., Daly City—APARTMENT HOUSES—Carlon Realty Co., 2790 Junipero Sierra Blvd., apartment houses, incl. 425 units, swimming pool near Broadmoor Subdivision. $3,000,000.

▲ Calif., Hayward—APARTMENT UNITS—Multi Development Corp., c/o Remo Calonico, archt., 2063 Mountain Blvd., Oakland, apartment units, $1,000,000.

▲ Calif., Oakland—OFFICE—First Western Bank & Trust Co., 405 Montgomery St., San Francisco, 15-18 story office and large garage, Broadway and 14 St. $6,000,000.

▲ Calif., Pasadena—DEPARTMENT STORE—J. W. Robinson Co., 600 W. 7 St., Los Angeles, plans by Pereira & Luckman, 9220 Sunset Blvd., Los Angeles, Zone 46, 160,000 sq. ft. department store. $5,500,000. Raymond Loewy Corp., 488 Madison Ave., New York, N. Y., designer.

(Continued on page 102)

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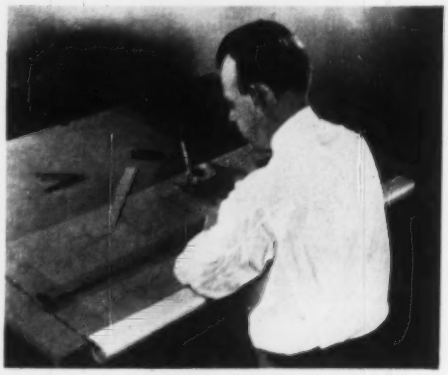

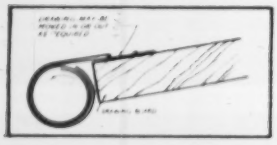

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(Continued from page 100)

▲ Calif., Santa Barbara—APARTMENTS—George H. Phillips, 5738 Sepulveda Blvd., Culver City, plans by Trojan Drafting Studios, 45314 Lemert Blvd., Los Angeles, 22 two story, frame, stucco apartments. $2,090,000.

▲ Conn., Danbury—HOSPITAL—Danbury Hospital, Locust Ave., plans by Rogers & Butler, 219 E. 44 St., New York, N. Y., 6 story hospital addn., Locust Ave. $2,400,000.

▲ Conn., Hartford—APARTMENT—Aaron Dubitzky, Pontiac Rd., West Hartford, plans by Berenson & West, 48 Forest St., 6 story apartment, Farmington Ave. $1,000,000.

▲ Mich., Lansing—HOSPITAL—Edward Sparrow Hospital, Bd. Trustees, 1215 E. Michigan St., plans by James H. Ritchie Assoc., 135 Clarendon St., Boston, Mass., and Ollie J. Munson Assoc., 409 Wilson Bldg., constr. Sparrow Hospital, 8 level addn. to west wing, alterations to main bldg. and Post and Chapin Wings, $2,980,000. Bids in the Fall.—CD 12/8/52.

▲ Mich., Melvindale—SHOPPING CENTER—Oakland Mortgage Co., c/o Charles N. Agree, Inc., archts., 1140 Book Bldg., Detroit, Zone 26, shopping center, incl. 25 stores, Greenfield and Oakwood Rds., $2,000,000.

▲ Mich., Southfield—HOTEL—Owner, c/o Horace Carpenter, Jr., gen. mgr., Northland Center, Inc., BC-2 Southfield St., Detroit, Zone 19, hotel, $1,000,000.

▲ Mo., Grandview—HOUSING—Procurement Office, Grandview Air Force Base, plans by L. H. Geis, 7920 State Line, Kansas City, Mo., and G. H. Dahl & Assoc., 2101 N. St. Paul St., Dallas, Tex., construct and finance 700 housing units, Grandview Air Force Base, $9,500,000. CD 4/11.

▲ Mo., St. Louis—STORE and OFFICE—Shop Plaza Realty Corp., Richard R. Hoffman, 32 Fox Meadow Lane, Sappington, Zone 23, 3 story, store and office with garage in bsmnt., area on 16,500 sq. ft. site, Kingshighway at Chippewa St. $1,000,000.

▲ N. J., Franklin Park—HOUSING—Herbert Kendall, Franklin Park, plans by Davis Savage, Drakes Corner Rd., Princeton, 500-house development, South Brunswick Twp. $6,000,000.

▲ O., Columbus—HOUSING—Lockbourne Air Base, Columbus, plans by Inscho, Brand & Inscho, 60 E. Broad St., construct and finance, 400 housing units. $5,400,000.

▲ O., Delaware—NATURAL SCIENCE BLDG.—Ohio Wesleyan University, Delaware, plans by Skidmore, Owings & Merrill, 575 Madison Ave., New York, N. Y. 100,000 sq. ft. natural science bldg. $3,000,000 equipped.

▲ O., Kent—HOMES—Ben Apelbaum & Sons, 163 E. Market St., Akron, 200, 1½ story homes, near Kent State University. $2,000,000.

▲ Pa., Baederwood—STORE—J. B. Van Sciver Co., Federal St., Camden, N. J., plans by Robert Montgomery Brown, 1728 Spruce St., Phila., furniture store and parking lot; $1,000,000. Keast & Hood, 2031 Chestnut St., Phila., consult. engrs. Bids in May. CD 2/29.

▲ Tex., Amarillo—SHOPPING CENTER—M. T. Johnson, Jr., 3608 Ong St., plans by George L. Dahl, archt.-consult. engr., 2101 N. St. Paul St., Dallas, Sunset Shopping Center. $4,000,000. CD 3/17/55.

▲ Tex., Austin—SHOPPING AREA—T. W. Berenson & Assocs., c/o Tom Muchard, 1208 C & I Life Ins. Co. Bldg., Houston, 33-acre shopping area, incl. 40 or more stores, and department store, in Northeast Austin, off U. S. Hy. 81 (interregional). $4,000,000.

▲ Tex., Beaumont—SHOPPING CENTER—Business Propertys, Inc., c/o C. D. Davis, Tyler, plans by Melvin J. Cates, 902 Bryant Petroleum Bldg., Tyler, 1 and 2 story, brick, stone, steel shopping center, $2,000,000.

▲ Tex., Dallas—DEPARTMENT STORE UNITS, etc.—Federated Department Stores, Inc., 1440 Broadway, New York, N. Y., department store units, 2 banks, post office, etc. U. S. Hy. 67 and 80. $10,000,000.

▲ Tex., Dallas—HOTEL—Owner, c/o J. N. McCammon, archt., Meadows Bldg., 150-300 room hotel, $1,000,000-$3,000,000.

▲ Tex., Del Rio—HOUSING—Purchasing Office, Laughlin Air Force Base, Del Rio, construct and finance, 500 unit family housing, Laughlin Air Force Base. $5,500,000.

▲ Tex., El Paso—HOUSING—Purchasing Office, Fort Bliss, El Paso, construct and finance 900 units family housing. $10,500,000.

▲ Tex., Grand Prairie—HOSPITAL—Hospitals, Inc., c/o Dr. C. C. Cupp, Grand Prairie, hospital. $2,000,000.

▲ Tex., Odessa—OFFICE—Sureway Finance & Investment Co., J. B. Etheredge, pres., Odessa, plans by Hodgens & Assocs., 300 N. Jackson St., and Ted Thomas, Odessa, 8 to 10 story office. No. 3-7th and N. Muskingum Sts. $1,000,000-$2,500,000.

▲ Tex., San Angelo—HOTEL—Owner, c/o J. N. McCammon, archt., Meadows Bldg., Dallas, 150-300 room masonry hotel. $1,000,000-$3,000,000.

▲ Tex., San Antonio—SCIENCE CITY—Southwest Research Center, 8500 Culebra Rd., constr. "Science City" to have industrial research laboratory bldgs., high level technical mfg. units for research and education, in 3,000 acre tract, off Culebra Rd. $20,000,000; 2,280 homes, utilities and allied constr. on 860 acres. $30,000,000.

▲ Que., St. Martin—SHOPPING CENTER—Ivanhoe Corp., 5400 Hochelaga St., Montreal, plans by Eliasoph & Berkowitz, 6931 Cote des Neiges Rd., Montreal, 35-store shopping center. Over $1,000,000.

INDUSTRIAL BUILDINGS

▲ **Colo., Denver**—REGIONAL PARTS DEPOT AND OFFICE—Caterpillar Tractor Co., 600 W. Washington St., Peoria, Ill., 1 story, 500,000 sq. ft. regional parts depot and office, $3,000,000-$3,300,000. Bids in June. F. R. Orr Constr. Co., 4414 Vine St., Denver, Colo., consult. engr. CD 10/26/53.

▲ **Colo., Silt**—MILL—J. & J. Rogers Co., Ausable Forks, N. Y., newsprint mill, near here. $9,750,000.

▲ **Fla., Jacksonville**—MILL—National Container Corp., 7 Central Park West, New York, N. Y., Kraft Pulp and Board Mill addn., 100-acre tract on St. John's River adjoining present mill. $25,000,000.

▲ **Ga., Atlanta**—WAREHOUSE, etc.—Davison-Paxon Co., 180 Peachtree St. W., plans by James C. Wise, 305 Techwood Dr. N.W., warehouse and service bldg. Over $1,000,000.

▲ **Ind., Greenfield**—RESEARCH CENTER—Eli Lilly & Co., 740 S. Alabama St., Indianapolis, agricultural research center, incl. 12 buildings, 417-acre tract, near biological laboratories. $3,000,000. Construction mid-summer 1956. CD

▲ **Ky., Lexington**—PLANT—R. J. Reynolds Tobacco Co., Reynolds Bldg., Winston-Salem, N. C., stemming and redrying plant. $15,000,000. Site purchased. CD 3/4/52.

▲ **Mass., Foxboro**—FACTORY—The Foxboro Co., Neponset, plans by Korslund, LeNormand & Quann, 506 Washington St., Norwood, factory addn. $1,500,000.

▲ **Minn., Elk River**—POWER PLANT—Rural Cooperative Power Assoc., Elk River, 22,000 kw closed cycle boiler water reactor power plant, $9,310,000. AMF Atomics, Inc., (sub. American Machine & Foundry Co.), 261 Madison Ave., New York 16, N. Y., consult. engr. Negotiations underway with Atomic Energy Commission. Work will proceed about 18 months following completion of negotiations.

▲ **Minn., Golden Valley (P.O. Minneapolis)**—WAREHOUSE—Minneapolis-Honeywell Regulator Co., 2743 Fourth Ave. S., Minneapolis, plans by Ellerbe & Co., E. 505 First National Bank Bldg., St. Paul, 1 story, 200,000 sq. ft. central warehouse at site west of Douglas Dr. and north of Minneapolis, Northfield & Southern R.R. tracks. $2,000,000. CD 12/22.

▲ **N. M., Gallup**—REFINERY—El Paso Natural Gas Products Co., E. P. N. G. Co. Bldg., El Paso, Tex., refinery, incl. catalytic cracking, alkylation and platforming units. $6,000,000. Universal Oil Products Co., 30 Algonquin Rd., Des Plaines, Ill., consult. engrs. CD 9/9/52.

▲ **Pa., Butler**—PLANT—United States Steel Corp., 525 Wm. Penn Pl., Pittsburgh, three units, iron ore sintering plant, at Houseville, near here. $30,000,000. Work to begin next month.

▲ **Pa., Marcus Hook**—PLANT—Sun Oil Co., 1608 Walnut St., Phila., ammonia plant, $30,000,000.

▲ **Pa., Valley Forge**—LABORATORIES—General Electric Co., River Rd., Schenectady, N. Y., missile laboratories, $10,000,000.

▲ **S. C., Moncks Corner**—GENERATING PLANT—South Carolina Electric & Gas Co., 328 Main St., Columbia, S. C., steam generating plant, near here. $50,000,000. CD 10/23/53.

▲ **Tex., Alpine**—FACTORY—Sears Roebuck & Co., 925 S. Homan St., Chicago, Ill., clothing mfg. factory. $1,000,000.

▲ **Tex., Houston**—PLANT—Sheffield Steel Corp., Industrial Rd., steel plant expansion. $21,000,000. CD 2/13/51.

▲ **Tex., Mission**—POWER PLANT, etc.—Central Power & Light Co., 120 N. Chaparral St., Corpus Christi, electric power plant, $7,000,000; some power lines, $200,000, 5-acre tract, near here.

▲ **Tex., Monahans**—GENERATING PLANT, etc.—Texas Electric Service Co., 406 W. 7 St., Fort Worth, single-unit electric power generating plant, $15,000,000; storage unit, $100,000; some power lines, $200,000, in Permian Basin, near here.

▲ **Utah, Brigham City**—ROCKET FUEL PLANT—Thiokol Chemical Corp., J. W. Crosby, pres., 778 N. Clinton Ave., Trenton, N. J., rocket fuel plant, 10 mi. west of here. $3,000,000.

▲ **Que., Montreal East**—MAINTENANCE, etc.—Imperial Oil Ltd., 56 Church St., Toronto, Ont., 200x300 ft. maintenance bldg., loading facilities and water tower. $2,000,000. Surveyor, Nenninger & Chenevert, 1440 St. Catherine St. W., Montreal, consult. engrs.

UNCLASSIFIED

▲ **Ala., Montgomery**—COMMUNITY CENTERS, etc.—City, City Hall, $1,255,000 bond election May 29, 6 community centers, buildings, playgrounds, pools, etc.

▲ **Ohio**—PIPE LINE—Standard Oil Co. of Ohio, Midland Bldg., Cleveland, 40 mi. 8 in. pipe line from Mogadore to terminal north of Rte. 422, east of Rte. 46. $1,100,000.

▲ **Tex., Corpus Christi**—RESORT FACILITIES—North Shore Marina, Inc., c/o J. M. Goldston, 634 Ralston St., plans by Goldston Co., c/o owner, resort facilities, incl. lodge, private club, recreation center, repair yard-shop, 112 slips for pleasure boats, etc., $1,000,000; rein.-con. swimming pool, $75,000, at Ingleside Cove.

▲ **Tex., Houston**—CEMETERY—Memorial Oaks, Inc., c/o Elmer E. Carey, 3301 Montrose St., plans by Wylie W. Vale, 517 W. Gray St., cemetery proj., incl. mausoleum, 3-acre lake, chapel, administration bldg., water sys., drainage, etc., 63-acre tract, 2 mi. east of Addicks on Katy Rd. $1,000,000.

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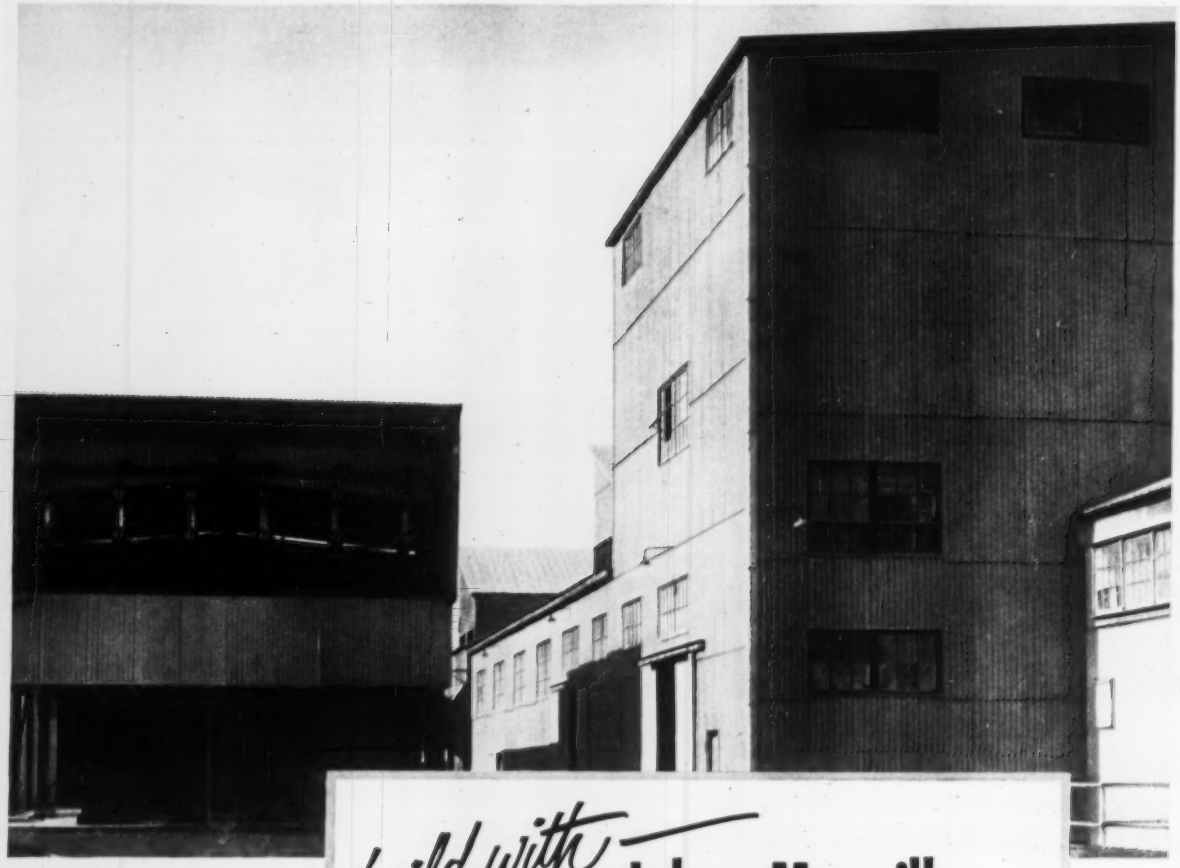

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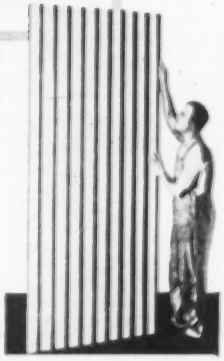

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BUILDINGS—BA

▲† Mass., Bedford—ADMISSION and TREATMENT—BA 6/26—Veterans Admin., Munitions Bldg., Wash., D. C., 5 story, 125,000 sq. ft., rein.-con.; masonry Admission and Treatment Bldg. No. 78, incl. air-conditioning, electrical work, elevators, outside distr. sys., roads, walks, grading, etc. $2,000,000. CD 3/13.

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▲ MASSACHUSETTS—Commonwealth of Mass., Dpt. P. Wks., 100 Nashua St., Boston.

M. DeMatteo Constr. Co., 200 Hancock St., Quincy, Mass., CA $2,315,714, est. $2,616,497. Contr. No. 4, Northeast Expressway, Malden St. to Cutler Hy., Revere. (Correction-contractor). CO 3/29, under CA.

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STATE HIGHWAY LETTINGS

BRIDGES

May 15, 17, 22 Maryland — June 8 Pennsylvania

BUILDINGS—BA

▲† N. Y., Brookhaven—ENGINEERING WORKS AREA—BA On Or About 6/7—U. S. Atomic Energy Comn., Upton, constr. Engineering Works Area at Brookhaven National Laboratory, comprising an integrated structure which will house experimental equip. for conduct of research and development in liquid metal fuel reactor field, 100x100 ft. bldg. with four 15 ft., 14 ft., 50 ft., 20 ft. bays, 50 ft. bay will have a clear headroom of 45 ft. and will house 20 ton crane to operate the full length of the bldg. with provision for a 4 ton monorail, distance from floor level to crane hook will be 35 ft., two side bays adjacent to 50 ft. bay will have a clear headroom of 20 ft., outside 15 ft. side bay which will have an office, locker, etc. with a height of 12 ft., structural steel is being procured separately. Plans deposit $20. Francisco & Jacobus, 511 Fifth Ave., New York, Zone 17, engrs.-archts. CD 1/13/54.

▲ N. Y., Latham Corners—SHOPPING CENTER—BA About 6/20—Latham Enterprises, Inc., 111 S. Main Ave., Albany, shopping center, incl. 50 stores, parking lot, at intersection of U.S. Rte. 9 and N. Y. St. Rte. 7 at Latham Circle. $5,000,000. Howard T. Fisher & Assoc., 270 Park Ave., New York, Zone 17, archts. Elpel Eng. Co., 101 Park Ave., New York, Zone 17, consult. engr. CD 12/20.

HEAVY CONSTRUCTION—LB & CA

▲ George A. Fuller Co., 597 Madison Ave., New York 22, N. Y. CA Est. $12,000,000-$14,000,000. harness race track, WESTBURY, N. Y. Roosevelt Raceway, Inc., Roosevelt Raceway, Westbury, N. Y. Arthur Froehlich, 203 S. 15 St., Phila., Pa., archt. CD 11/24/54.

▲† J. A. Jones Constr. Co., 209 W. Fourth St., Charlotte, N. C. and Charles H. Tompkins Co., 907 16th St. N. W., Wash., D. C. CA $8,622,919, constr. Hildebrand Lock and Dam Proj. on Monongahela River, PENNSYLVANIA and WEST VIRGINIA. U. S. Eng., 925 New Federal Bldg., Pittsburgh 19, Pa. Bids Mar. 27. CD 4/3, under LB.

▲† George F. Hazelwood, Cumberland, Md. CA $2,854,-253. flood protection proj., channel imprv., Wills Creek Sect. No. 4, constr. Western Road Railway Bridge No. 1659 and Baltimore Street Highway Bridge, Cumberland, Md. and Ridgeley, W. Va., MARYLAND and WEST VIRGINIA. U. S. Eng., First and Douglas Sts. N. W., Wash., D. C. CD 4/19, under LB.

BUILDINGS—LB & CA

▲ John W. Rouse Constr. Co., Gouverneur, N. Y. LB $1,722,722. JUNIOR-SENIOR HIGH SCHOOL, CARTHAGE, N. Y. Carthage Central School Dist., Carthage, N. Y. Bids Apr. 26. CD 4/11.

▲ Wenwood at Bar Harbour Homes, c/o Stanley Shaftel, archt., 166-21 90 Ave. Jamaica, N. Y. Owner Builds. $2,500,000. 96 HOUSES, 32-acre site south of Merrick Rd. and east of Rte. 107, MASSAPEQUA, N. Y.

▲ Joseph P. Blitz, Inc., 545 Madison Ave., New York 22, N. Y. CA Est. $8,000,000. First 2 of 5 fourteen to sixteen story BUILDINGS to house staffs of N.Y.U. Medical College and Bellevue Hospital, 30 St., 33 St., First and Second Aves. NEW YORK, N. Y. University Center, Inc., c/o David Haimes, 1 E. 57 St., New York 22, N. Y. S. J. Kessler & Sons, 551 Fifth Ave., New York 17, N. Y., archts. CD 12/21/54.

▲ Sunset City Shopping Center, c/o A. H. Salkowitz, archt., 87-25 Homelawn St., Jamaica, N. Y. Owner Builds. $1,500,000. SHOPPING CENTER, 25-stores, parking for 1,500 cars and 16-acre tract at Deer Park Ave. between Woods Ave. and Belmont Rd., NORTH BABYLON, N. Y.

▲ Howard J. Mullen, Saddle River, N. J., Own Forces, $2,500,000-$3,000,000. 50 HOMES, Chestnut Ridge Rd. and Allendale Ave., SADDLE RIVER, N. J. Eugene J. Maniscalco, 909 Main St., Hackensack, N. J., archt.

SOUTH

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

May 15 North Carolina — May 16 Virginia

May 24 Florida

STREETS AND ROADS

May 15 North Carolina — May 16 Virginia

BUILDINGS—LB & CA

▲ Cafritz Constr. Co., 1404 K St., N.W., Wash., D. C., CA Est. $4,500,000. 452-unit APARTMENT, flat plate constr. on pile fdn., 1112 S. Army-Navy Dr., ARLINGTON, VA. H Street Corp. & Ambassador, Inc., 1404 K St., N.W., Wash., D. C. Edwin Weihe, 927 15th St. N. W., Wash., D. C., archt.

▲ Doyle & Russell, 825 W. 21 St., Norfolk, Va., CA $3,905,200, 9 story first wing of HOSPITAL, NORFOLK, VA. Norfolk General Hospital, Raleigh Ave., Norfolk, Va. Bids Apr. 12, awarded Apr. 25. (Correction—owner). CD 5/2, under CA.

▲ R. R. Richardson & Co., 25 St. and Newport Ave., Norfolk, Va., CA $1,379,357. 3 story HOSPITAL addn., NORFOLK, VA. St. Vincent DePaul Hospital, Cranby St. and Kingsley Lane, Norfolk, Va. CD 4/10, under LB.

▲ The H. K. Ferguson Co., 1783 E. 11 St., Cleveland, O., CA design and construct PLANT to produce Zirconium for atomic reactors, PARKERSBURG, W. VA. Carborundum Metals Co., Inc., (sub Carborundum Co.) Buffalo Ave., Niagara Falls, N. Y.

▲ Frank H. Connor Co., 711 S. Troyon St., Charlotte, N. C., LB $1,028,000. CREAMERY PLANT, ASHEVILLE, N. C. Biltmore Dairy Farms, Biltmore, N. C. Six Associates, Inc. & J. Bertram King, 1095 Hendersonville Rd., Asheville, N. C., archts. Bids Apr. 24. CD 2/15/46.

▲ West Building Co., Reynolds Bldg., Winston-Salem, N. C. CA $1,608,750. COURT HOUSE, JAIL, SPARTANBURG, S. C. Spartanburg Co., Court House, Spartanburg, S. C. Bids Apr. 11. CD 4/19, under LB.

Perusini Constr. Co., 1720 28 Ave. S., Birmingham 9, Ala. Owner Builds, $960,000. 60 HOMES, in Glenwood Dr. area, HUNTSVILLE, ALA.

▲ Struck Constr. Co., 147 N. Clay St., Louisville, Ky., CA, Total est. $5,000,000. superstructure and conveyor trestle housings for MANUFACTURING BLDGS. Benchel, LOUISVILLE, KY. General Electric Co., Appliance Park, Louisville, Ky. Bids Apr. 13, awarded Apr. 27. CD 3/26.

MIDDLE WEST

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

STREETS AND ROADS

May 15 Indiana — May 29 Ohio

▲ O., Cleveland—RECREATION CENTERS—BA 5/24—City, Div. P. Properties, John J. Lucosco, dir., City Hall, Zone 14, recreation centers, E. 82 St. and Lucia Ave. S. E., $650,000; Fulton Rd. and Shadyside Ave. $650,000. Plans deposit $50 each. Joseph Gattozzi, 2487 Noble Rd., Zone 21, archt. CD 1/17.

BUILDINGS—BA

▲ Mich., Eloise—HOSPITAL FACILITIES—BA 5/21—Wayne County Auditors Office, 1222 City County Bldg., Detroit, Zone 26, rehabilitate facilities for boilers, boiler auxiliaries and stokers, Wayne County General Hospital, $1,390,000. Plans deposit $25. H. E. Beyster & Assoc., Inc., 700 Griswold Bldg., Detroit, Zone 26, archt. CD 3/20.

▲ Wis., Watertown—ADULTS, etc.—BA 5/28—Bethesda Lutheran Home, Watertown, 4 story adults bldg., 2 story school. $2,000,000. Plans deposit $50. E. A. Stubenrauch & Assocs., 712 Erie Ave., Sheboygan, archts. CD 6/16/54.

▲† Wis., Green Bay—POST OFFICE—BA 5/29—General Service Admin., Room 575, Court House, 219 South Clark St., Chicago, Ill., post office and federal bldg. $1,615,000. Foeller, Schober, Berners, Safford & Jahn, 310 Pine St., archts. CD 7/7.

BUILDINGS—SLC

▲ Mich., Grayling—HOSPITAL—Sisters of Mercy, Grayling, Mercy Hospital, Grayling, soon lets contract hospital $1,000,000. Extended date, Gordon Cornwell, Anderson Bldg., Traverse City, archt. E. Roger Hewitt, 1110 S. Penn Ave., Lansing, engr. CD 4/13.

HEAVY CONSTRUCTION—LB & CA

▲ United Constr. Co., 1204 Lincoln Ave., Pittsburgh, Pa., LB $1,270,872 (2 bidders) Willowick NIKE site; LB $1,121,278 (2 bidders) Rocky River-Fairview Park NIKE site, OHIO. U. S. Eng., New Post Office Bldg., Pittsburgh, Pa. Bids Apr. 24;
Horvitz Co., 4735 E. 146 St., Cleveland, O., LB $2,887,984 (2 bidders) Bratenahl NIKE site (Ohio);
Schirmer-Peterson Co., 2719 Detroit St., Cleveland, O., LB $2,153,675 (3 bidders) Edgewater Park NIKE site (Ohio).

▲ John F. Casey Co., Aspinwall, Pittsburgh, Pa. CA Est. $1,000,000. spur track to service new Chrysler Stamping Plant, incl. fillwork, grading, abutments and piers, MACEDONIA, O. Pennsylvania R. R. (Central Region). D. L. Sommerville, ch. engr. Penna. Station, Pittsburgh 22, Pa. CD 1/12.

▲ MICHIGAN—State Hy. Dpt., Stevens T. Mason Bldg., Lansing,
Mich.—W. J. Muehlenbeck, 1253 S. Water St., Saginaw, Mich. LB $575,758, est. $600,000 (5 bidders) dual 24 ft. c. conc. 1.373 mi. relocation of US-23 from Rabiee Rd. north to Arlene Dr., BM 25-55 C2-RO, etc., Genesee Co.;
Mich.—Pierson Contg. Co. & Louis Garavaglia, 24240 Mound Rd., Center Line, Mich. LB $771,732, est. $720,000 (9 bidders) c. conc. 10.253 mi. M-40, F 80-15 C6-R (F 47 7), etc., Van Buren Co.; LB $1,187,252, est. $1,200,000 (11 bidders) c. conc. 22 ft. wide 5.546 mi. on relocation of M-60 from US-31 east to east of Barron Lake, F 11-73 C3-R, etc., Berrien and Cass Counties;
Mich.—M. T. Lardner & Co., Port Huron, Mich. LB $185,299, est. $210,000 (10 bidders) bit. aggregate surf. 13.033 mi. FAS Rte. 1220, 12223 Allen Rd., Beach Rd., Aikens Rd., 32 St., Yeager St. and Infirmary Dr., CS 77-83 C2 (S 826 2), etc., St. Clair Co.;
Mich.—Alpine Constr. Co. & Straits Constr. Co., St. Ignace, Mich. LB $646,634, est. $660,000 (8 bidders) 23 ft. stabilized aggregate surf. 7.227 mi. M-68 from US-23 westerly, also bridge over Trout River 3.8 mi. west of Rogers City, F 71-17 C6-R, etc., Presque Isle Co.;
Mich.—Louis Garavaglia, 24240 Mound Rd., Center Line, Mich. LB $422,099, est. $400,000 (12 bidders) c. conc. wid'n. & conc. surf.—5.591—mi. M-21, M-13, M-71, M-47, F 76-1 C2-U, etc., Genesee and Shiawassee Counties;
Mich.—The Hicks Co., 624 E. Superior St., Alma, Mich. LB $81,730, est. $80,000 (9 bidders) 20 ft. bit. aggregate surf. 9.659 mi. FAS Rte. 922, 289, 1177 and 53 and Smith Crossing Rd., CS 56-34 C2 (S 992 5), etc., Midland Co.;
Mich.—William Bros. Co., Ionia, Mich. LB $166,742, est. $160,000. bit. surf. 17.217 mi., (4.09) hot plant mix on parts of Routes FAS 121, 126, 551 and 875, CS 74-50 C3 (S 296 3), etc., Sanilac Co.; LB $82,385, est. $65,000. (7 bidders) 20 ft. bit. aggregate surf. 11.034 mi., 4.09 modified on FAS Rte. No. 650, 1346 and 180, CS 6-33 C2 (S 471 3), etc., Arenac Co.;
Mich.—Bowen & Fullerton, Perrysburg, Mich. LB $138,-519, est. $150,000. (5 bidders) aggregate base course concrete curb and gutter bit. binder and wearing course 1.304 mi. FAS 1158 from Ketcton Ave. south of Broadway, CS 61-31 C2 (S 1158 1), Muskegon Co.;
Mich.—H. C. Shingledecker Co. & Comstock Constr. Co., Pontiac, Mich. LB $271,532, est. $310,000. (9 bidders) 25 ft. aggregate base course prime and double seal 4.887 mi. M-24 from M-46 north to Village limits of Caro, F 79-48 C8-R (F 385 8), Tuscola Co.;
Mich.—L. W. Edison Co., 924 Floral Dr. S.E., Grand Rapids, Mich. LB $715,864, est. $720,000 (10 bidders) 24 in. c. conc. 2.622 mi. relocation US-31 from 100 St. north to 76 St., M-41-85 C2-RN, Kent Co.;
Mich.—East Shore Asphalt & Paving Co., Alpena, Mich. LB $87,602, est. $80,000. (8 bidders) bit. aggregate surf. course 16.602 mi., 4.09 modified on parts of Rtes. FAS 511, 637 County Roads 13, 10, 22 and 16, CS 65-26 C2 (S 92 2), etc., Ogemaw Co. Bids Apr. 25. CD 4/12 and 4/20.

BUILDINGS—LB & CA

▲ Porath Realty Co., 2828 Euclid Ave., Cleveland 15, O. Owner Builds. $4,000,000. 138,650 sq. ft. SHOPPING CENTER, Oakwood Plaza, 16½ acre site Pearl Ave. from 40 St. to Homewood Dr., LORAIN, O. CD 4/24.

▲ Keyes—Treuhaft Co., 10514 Shaker Blvd., Cleveland 4, O. Own Forces. $10,000,000. 300 pre-fabricated HOMES, on 102-acre site to be known as Meadow Wood, Richmond Rd. LYNDHURST, O.

▲ The McDowell Co., Inc., 3203 W. 71 St., Cleveland, O. CA Est. $7,000,000-$8,000,000. design and construct 70x250 ft. x 80 ft. high sintering PLANT, handling equip. will incl. 4,000 ft. conveyor belts, 100,000 cu. ft. storage bins, at Ohio Works on Mahoning River bank east of Division St., YOUNGSTOWN, O. U. S. Steel Corp., 71 Broadway, New York, N. Y. CD 3/26.

▲ Kroening Eng. Corp., 4500 W. Mitchell St., Milwaukee, Wis., LB $2,317,890. SENIOR HIGH SCHOOL, WAUKESHA, WIS. Bd. Educ., Waukesha, Wis. Bids Apr. 26. CD 3/28.

▲ Charfoos & Topper, 18304 James Couzens Hy., Detroit 35, Mich. Owner Builds. $3,500,000. Ardmore Park Manor, 270 brick HOMES, Tappert and Nine Mile Rd., EAST DETROIT, MICH.

▲ Sarver & LaVelle, Joseph F. LaVelle, Flint, Mich. Owner Builds. $1,750,000. 125 brick HOMES, Bilsky Rd., Burton Twp., FLINT, MICH.

WEST OF MISSISSIPPI

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

May 17, 18 Kansas

STREETS AND ROADS

May 17, 18 Kansas — May 18 Minnesota

BUILDINGS—BA

▲ Tex., Houston—BANK—BA 5/22—Federal Reserve Bank of Dallas, 400 S. Akard St., Dallas, 4 level

masonry Federal Reserve Bank Branch. $2,100,000. Phelps & DeWees & Simmons, 342 W. Woodlawn St., San Antonio, and Goleman & Rolfe, 5100 Travis St., archts. CD 2/23/55.

▲ **N. D., Minot**—HIGH SCHOOL—BA 5/23—Bd. Educ., Special School Dist. 1, Minot, 1 story, 75,000 sq. ft. steel, brick, concrete block. Erik Ramstad Junior High School. $1,110,000. Brunner, Hoeffel & Bohrer, Minot, archts. CD 10/25.

▲ **Minn., Crookston**—SCHOOL—BA 5/24—Bd. Educ., G. E. Kronholm, clk., high school addn. $1,250,000. Plans deposit $25. Toltz, King, Duvall, Anderson & Assoc., 1509 Pioneer Bldg., St. Paul, archts. CD 5/23.

▲ **Minn., Grand Rapids**—SCHOOL—BA 5/25—Bd. Educ., J. A. Anderson, clk., 2 story Junior High School. $1,000,000. Plans deposit $25. A. R. Melander, 693 Alworth Bldg., Duluth, archt. CD 21/17.

▲ **Iowa, Des Moines**—TECHNICAL SCHOOL—BA 5/29—Bd. Educ., 629 3 St., converting old Solar Aircraft Co. building into new Technical School, incl. swimming pool. $2,400,000. Wetherell & Harrison, 506 Shops Bldg., archts. CD 12/8.

▲ **Mo., Columbia**—DORMITORIES, etc.—BA 5/31—Curators of University of Missouri, Dale O. Bowling, bus. mgr., 123 Jesse Hall, Columbia, 4 story, 39x228 ft., and 5 story, 39x228 ft., brick, precast concrete men's dormitories; 2 story, 74x110 ft. cafeteria bldg. $1,000,000. Helmuth, Obata & Kassabaum, Inc., 315 N. 10 St., St. Louis 1, Mo., archt. CD 2/1.

▲ **Mo., Pagedale (St. Louis 21 P.O.)**—HOSPITAL—BA 6/6—St. Vincent's Hospital, Daughters of Charity of St. Vincent de Paul, 7301 St. Charles Rock Rd., St. Louis, Zone 21, 4 story, 67x169 ft., brick, concrete, steel, masonry hospital addn. $1,250,000. Maguolo & Quick, 4908 Delmar Blvd., St. Louis, Zone 8, archts. CD 2/15.

▲ **Tex., Crane**—GASOLINE PLANT—Bids Asked. Atlantic Refining Co., Atlantic Bldg., Dallas, 25 million cu. ft. daily capacity absorption gasoline plant, near here. Est. $4,000,000. CD 4/26.

HEAVY CONSTRUCTION—LB & CA

▲ **MINNESOTA**—State Hy. Dpt., 1246 University Ave., St. Paul.

Minn.—**J. Dieseth Co.**, Fergus Falls, Minn. LB $1,016,713. (10 bidders) grav. base, road-mixed bit. base 20.1 mi. between Cass Lake and Walker, Cass Co.; LB $298,297. (4 bidders) grav. base 9.8 mi. between Madison and Sellingham, Lac qui Parle Co.

Minn.—**Woodrich Constr. Co.**, Hopkins, Minn. LB $530,397. (8 bidders) c. conc. 8.8 mi. T.H. 71 between Bergen and 6.0 th Windom, Cottonwood and Jackson Counties; LB $383,624. (5 bidders) grav. base, concrete base, b. conc. wearing course 1.6 mi. in Duluth on Third St., St. Louis Co.;

Minn.—**Freeman Constr. Co.**, Spring Valley, Minn. LB $238,317. (6 bidders) grading 3.9 mi. between 1.5 mi. south of T.H. 16 and 0.3 mi. north of north limits of Brownsdale, Houston Co.;

Minn.—**Kimmes Constr. Co.**, Hastings, Minn. LB $181,833. (11 bidders) grav. base, road-mixed bit. surf. 11.1 mi. between Northfield and Nerstrand, Rice Co.;

Minn.—**Park Constr. Co.**, 51 37 Ave. N.E., Minneapolis, Minn. LB $77,173. (6 bidders) grav. base plant-mixed bit. surf. 0.5 mi. in Little Falls, Morrison Co.;

Minn.—**Quarve & Anderson**, Hy. No. 52 S., Rochester, Minn. LB $159,390. (3 bidders) crushed rock base, plant-mixed bit. surf. 6.6 mi. T.H. 74 between Chatfield and 2 mi. southwest of Troy, Fillmore and Olmsted Counties. Bids Apr. 27. CD 4/13.

▲† **Al Johnson Constr. Co.**, Foshay Tower, Minneapolis, Minn. CA $4,762,666. spillway and completion of embankment Toronto Dam at Verdigris River, 100 mi. north of Tulsa, Okla.; Inv. 34-066-56-46, KANSAS U. S. Eng., Box 61, Tulsa, Okla. CD 4/25, under LB.

▲† **Dondlinger & Sons Constr. Co., Inc.**, 1206 E. Lincoln St., Wichita, Kan. LB $1,210,000, est. 1,232,150 industrial waste treatment plant, for Air Force, WICHITA, KAN. Boeing Airplane Co., Plant No. II, Personnel Bldg., Wichita, Kan. Bids Apr. 26. CD 3/27.

▲† **Allen M. Campbell Co.**, P. O. Box 836, Tyler, Tex. CA $1,109,661. Schedule A, static missile test facilities, Holloman Air Force Base; ENG 29-008-56-76, ALAMOGORDO, N. M. U. S. Eng., Box 1538, Albuquerque, N. M. CD 4/20, under LB.

Brodie Constr. Co., P. O. Box 2064, Amarillo, Tex. CA $1,109,897. Schedule B, (Alamogordo, N. M.).

BUILDINGS—LB & CA

▲ **Viking Constr. Co.**, 5948 Pleasant Ave., Minneapolis, Minn. CA $1,537,850. general constr., 5 story, bsmnt., 75x240 ft. PUBLIC HEALTH CENTER, Fourth St. and Third Ave. S., MINNEAPOLIS, MINN. City, G. R. Arneson, city purch. agt., 301 City Hall, Minneapolis, Minn. CD 4/13, under LB.

O. A. Stocke & Co., 115 S. 3 St., Rochester, Minn. LB $911,700. (4 bidders) general constr. CONTINUED TREATMENT BLDG. at Rochester State Hospital, ROCHESTER, MINN. State Dpt. Admin., State Capitol, St. Paul, Minn. Bids Apr. 26. CD 3/22.

▲† **Dickmann-Pickens-Bond Constr. Co.**, Gazet Bldg., Little Rock, Ark. CA Est. $9,500,000. rocket engine PLANT, FORT CROWDER, MO. Air Force Dpt., The Pentagon Bldg., Wash., D. C.; Aerojet General Corp., 6352 N. Irwindale Ave., Azusa, Calif. will operate.

▲ **Lecoutour Constr. Co.**, 1418 Hampton Ave., St. Louis 10, Mo. CA Est. $1,000,000. (first unit) 1 story, piston ring mfg. PLANT, 2 story OFFICE section on 56 acre site on Manchester Rd. near Weldman Rd., ST. LOUIS COUNTY, MO. Thompson Products, Inc., 23555 Euclid Ave., Cleveland 17, O. for subsidiary Ramsey Corp., 3693 Forest Park Blvd., St. Louis 8, Mo. Bids Apr. 10. CD 3/19.

▲† **Olson Constr. Co.**, 410 S. 7th St., Lincoln, Neb. CA $2,754,000, addnl. bldgs.; utilities at HOSPITAL, FORT MEADE, S. D. Veterans Admin., Vermont Ave. between H and I Sts. N. W., Wash. 25, D. C. Bids Apr. 17. CD 4/19, under LB.

▲ **Refinery Engineering Co.**, Wright Bldg., Tulsa, Okla. CA Approx. $2,750,000. design and construct ALKYLATION UNIT, McPHERSON, KAN. National Co-operative Refinery Assn., McPherson, Kan. CD 5/1.

▲ **Robert E. McKee, General Contractor, Inc.**, Box 2848, Inwood Station, Dallas 9, Tex.; LB $1,926,000. general constr. 21 story bsmnt. OFFICE, DALLAS, TEX. E. M. S. Development Co., 918 Reserve Loan Life Bldg., Dallas, Tex. Bids Apr. 19. CD 3/28.

▲ **Tellepsen Constr. Co.**, 1710 Telephone Rd., Houston, Tex. CA $1,250,000. RESEARCH CENTER; CA $975,000, INDUSTRIAL MFG. CENTER UNIT; CA $650,000, SERVICE CENTER, HOUSTON, TEX. Grand total $2,875,000. Dresser Industries, Inc., 1619 Ovid St., Houston, Tex. CD 4/18.

▲ **Empire Plaza**, c/o Jaffe & Martin, 4623 Blanco Rd., San Antonio, Tex. Own Forces. $1,000,000. SHOPPING CENTER, SAN ANTONIO, TEX. Valdez & Williams, 918 Manor Dr., San Antonio, Tex., archts. Beretta, Greenslade, Clark & Collins, 1927 N. St. Marys St., and Jean Edens, 113 Gen. Krueger St., San Antonio, Tex., engrs. CD 10/3.

▲ **Refinery Engineering Co.**, Wright Bldg., Tulsa, Okla. CA Est. $2,750,000. design and construct distillation REFINERY UNIT, TEXAS CITY, TEX. Republic Oil Refining Co., Texas City, Tex. CD 4/30.

▲ **Mead & Mount**, 1560 Denver Club Bldg., Denver, Colo.; LB $1,430,000. general contract two 3 story women's DORMITORIES, 2 story DINING HALL addn., GREELEY, COLO. Colorado State College of Educ., Campus, Greeley, Colo. Bids Apr. 24. CD 3/21.

FAR WEST

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES
May 31 California

STREETS AND ROADS
May 31, June 1 California

▲† **California**—NIKE INSTALLATION—BA 5/23—U. S. Eng., 1209 B St., Sacramento. Third Nike installation at Travis Air Force Base, Solano Co., ENG-04-167-56-57, Spec. 2136. $1,000,000.

▲† **California**—BA 5/24—U. S. Eng., 751 S. Figueroa St., Los Angeles, Los Angeles River Improvement, Atlantic Ave. to 63 St., Maywood, Los Angeles Co., $2,500,000. CD 12/17/52.

▲† **Calif., San Diego**—TRAINING FACILITY—BA 5/25—Eleventh Naval Dist., San Diego, Special Weapons Training Facility, Naval Air Station, Spec. 49516. $1,295,000. CD 10/11.

BUILDINGS—BA

▲ **Utah, Salt Lake City**—HIGH SCHOOL—BA 5/29—Bd. Educ., 440 E. First South St., Highland High School. $3,000,000. R. Lloyd Snedaker, 606 Utah Saving & Trust Bldg., archt. CD 5/2.

▲ **Ariz., Phoenix**—ADMINISTRATION OFFICE—BA 6/1—Arizona Hy. Dpt., 1739 W. Jackson St., Phoenix, administrative and engineering bldg. for State Hy. Dpt. $1,000,000. Plans deposit $50. J. S. Mills & F. W. McIntire, c/o Highway Dpt., engrs. F. M. Guirey & J. H. MacDowell, 506 Camelback, St., assoc. archts. CD 4/25.

HEAVY CONSTRUCTION—LB & CA

† **Shea Co.**, 2801 W. Mission Rd., Alhambra, Calif., LB $957,280, est. $1,032,420, (6 bidders) Hills Creek Reservoir diversion tunnel, Middle Fork of Willamette River, Lane Co., OREGON U. S. Eng., 628 Pittock Block, Portland, Ore. Bids May 1. CD 3/20.

▲ **U. S. Steel Corp.**, 2345 N. W. Nicolai St., Portland, Ore.; LB $2,279,443, est. $2,242,338. (2 bidders) superstructure for Morrison St. Bridge, PORTLAND, ORE. Multnomah Co., Court House, Portland, Ore. Bids May 1. CD 4/9.

▲ **CALIFORNIA**—State Div. Hys., 120 S. Spring St., Los Angeles.

Webb & White and W. J. Disteli, 7220½ Melrose Ave., Los Angeles 27, Calif., CA $4,174,204. 3.8 mi. Long Beach Freeway, incl. 5 bridges and 2 pumping plants, Long Beach Freeway, Los Angeles Co. Bids Apr. 19, awarded Apr. 27. CD 4/24, under LB.

▲ **CALIFORNIA**—State Div. Hys., 1120 N St., Sacramento.

Madonna Constr. Co., P. O. Box 910, San Luis Obispo, Calif., CA $1,777,164. 7.1 mi. grading, paving, U.S. 101 and 3 bridges, north of Santa Maria, Ventura Co. Bids Apr. 4, awarded Apr. 24. CD 4/9, under LB.

▲† **T. M. Page Corp. & R.C.R. Corp.**, 145 West Duarte Rd., Monrovia, Calif., LB $1,850,854, San Antonio and Chico Creek Channels, Santa Ana River Basin, Los Angeles Co., CIVENG-04-353-56-47. CALIFORNIA U. S. Eng., 751 S. Figueroa St., Los Angeles, Calif. Bids May 2.

▲† **Winston Bros.**, 1530 California St., Monrovia, Calif., LB $1,960,780, est. $2,000,000. (9 bidders) Los Angeles River Improv., Florence Ave. to Stewart & Gray Rd., CIVENG-04-353-56-51, CALIFORNIA U. S. Eng., 751 S. Figueroa St., Los Angeles, Calif. Bids May 1. CD 4/10.

BUILDINGS—LB & CA

▲† **Ashton-Mardian**, 2025 E. 22 St., Tucson, Ariz., LB $2,233,395. (4 bidders) CLINICAL BLDG., Veterans Admin. Hospital, TUCSON, ARIZ. Veterans Admin., Munitions Bldg., Wash. 25, D. C. Place & Place, 9 N. Grossetta Ave., Tucson, Ariz., archts. Bids May 1. CD 3/28.

▲ **H. George & Sons**, Hutton Bldg., Spokane, Wash., CA, $1,837,613, general contract Shadle Park High SCHOOL, Ash and Longwellow Aves., SPOKANE, WASH. School Dist. 81, W. 503 4 St., Spokane, Wash. Bids Apr. 11. CD 4/18, under LB.

▲ **Hilp & Rhodes**, 918 Harrison St., San Francisco, Calif., CA, $1,500,000, STORE, San Antonio Rd. Shopping Center, MOUNTAIN VIEW, CALIF. Owner, c/o A. E. Alexander, archt., 918 Harrison St., San Francisco, Calif. Sears, Roebuck & Co., lessee. CD 8/18.

CANADA

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

STREETS AND ROADS
May 16 Ontario

▲ **Ont., Ottawa**—BA 5/22—City, City Hall, 2-lane road Carling Ave. from Bronson to Kirkwood Aves., 2.4 mi. conc. base, asph. top. Plans deposit $100. $1,153,000. L. W. Pillar, c/o owner, engr. CD 8/10/51.

▲ **Que., Bagotville**—HANGAR—BA 5/24—Defence Constr. Ltd., 56 Lyon St., Ottawa, 160 ft. span structural steel hangar, steam and electrical distributions, R.C.A.F. Station $1,500,000. Plans deposit $100.

BUILDINGS—BA

▲ **Ont., Ottawa**—APARTMENT—BA 5/17—Toronto General Trust Corp., 42 Sparks St., 7 story, apartment, Metcalfe St. at Frank St. $1,000,000. Greenspoon, Freedlander & Dunne, 4151 Sherbrooke St. W., Montreal, Que., archts.

HEAVY CONSTRUCTION—LB & CA

▲ **Mannix-O'Sullivan Paving Co. Ltd.**, 604 Northern Hardware Bldg., Edmonton, Alta., CA $1,146,128, asph. surf. grav. roadways in various locations, EDMONTON, ALTA. City, City Hall, Edmonton, Alta. Awarded Apr. 23. CD 11/4.

▲ **Standard Dredging Co.**, Burma Rd. E., St. John, N. B., CA $1,524,000 (5 bidders) dredging Courtenay Bay, ST. JOHN, N. B. Dpt. P. Wks. Hunter Bldg., Ottawa, Ont. Bids Feb. 29, awarded Apr. 15. CD 2/20.

▲ **Spino Construction Ltd.**, 200 Sauve St. W., Montreal, Que. LB $2,256,766. (3 bidders) collector sewer in Mercier Ward, MONTREAL, QUE. City, City Hall, Montreal, Que. CD 8/26.

BUILDINGS—LB & CA

Defence Constr. (1951) Ltd., 56 Lyon St., Ottawa, Ont., rejected bids Mar. 1, PHYSICAL TRAINING BLDG., WINNIPEG, MAN., LB $932,325. Project cancelled. CD 3/26, under LB.

▲ **Foundation Maritime Ltd.**, 135 Lower Water St., Halifax, N. S., CA Total est. $7,200,000, CONCENTRATOR, part of mining project, TILT COVE, NEWFOUNDLAND. Maritimes Mining Corp. Ltd., c/o M. J. Boylen Engineering Offices, 330 Bay St., Toronto, Ont. Awarded Apr. 13.

▲ **Sampson Constr. Ltd.**, 47 Cedar St., Sault Ste. Marie, Ont., LB $1,000,000, combined HIGH SCHOOL and PUBLIC SCHOOL, Wellington and Hugil Sts. area, SAULT STE MARIE, ONT. Sault Ste. Marie Bd. Educ., 644 Albert St. E., Sault Ste. Marie, Ont. Bids Mar. 29. CD 3/15.

▲ **United Engineers & Constructors**, 1440 St. Catherine St. W., Montreal, Que., CA Est. $15,000,000 equipped FACTORY, VARENNES, QUE. Canadian Titanium Pigments Ltd., 630 Dorchester St., Montreal, Que. United Engineers & Constructors; Drexel Bldg., Phila., Pa., U.S.A. and Surveyor, Nenniger & Chenevert, 1440 St. Catherine St. W., Montreal, Que., engrs. CD 2/1, under CA.

AMERICANS ABROAD

BUILDINGS—LB & CA

▲ **Morrison-Knudsen New Zealand, Ltd., Morrison-Knudsen Co. Inc.**, 319 Broadway Ave., Boise, Idaho, U.S.A., H. K. Ferguson Co., 1783 E. 11 St., Cleveland, O., U.S.A., and **Downer & Co. Ltd.**, New Zealand, CA (5 bidders) coal fired, steam driven GENERATING STATION, MERCER, NEW ZEALAND. Total est. $16,000,000. Govt. of New Zealand, Dpt. P. Wks., Wellington, New Zealand;
Babcock & Wilcox Co., 161 E. 42 St., New York, N. Y. U.S.A. CA six boilers (Mercer, New Zealand);
English Electric Ltd., England, CA 3 turbo-alternators (Mercer, New Zealand);
Metropolitan Vickers, Ltd., England, CA 3 turbo-alternators (Mercer, New Zealand).

LATIN AMERICA

HEAVY CONSTRUCTION—LB & CA

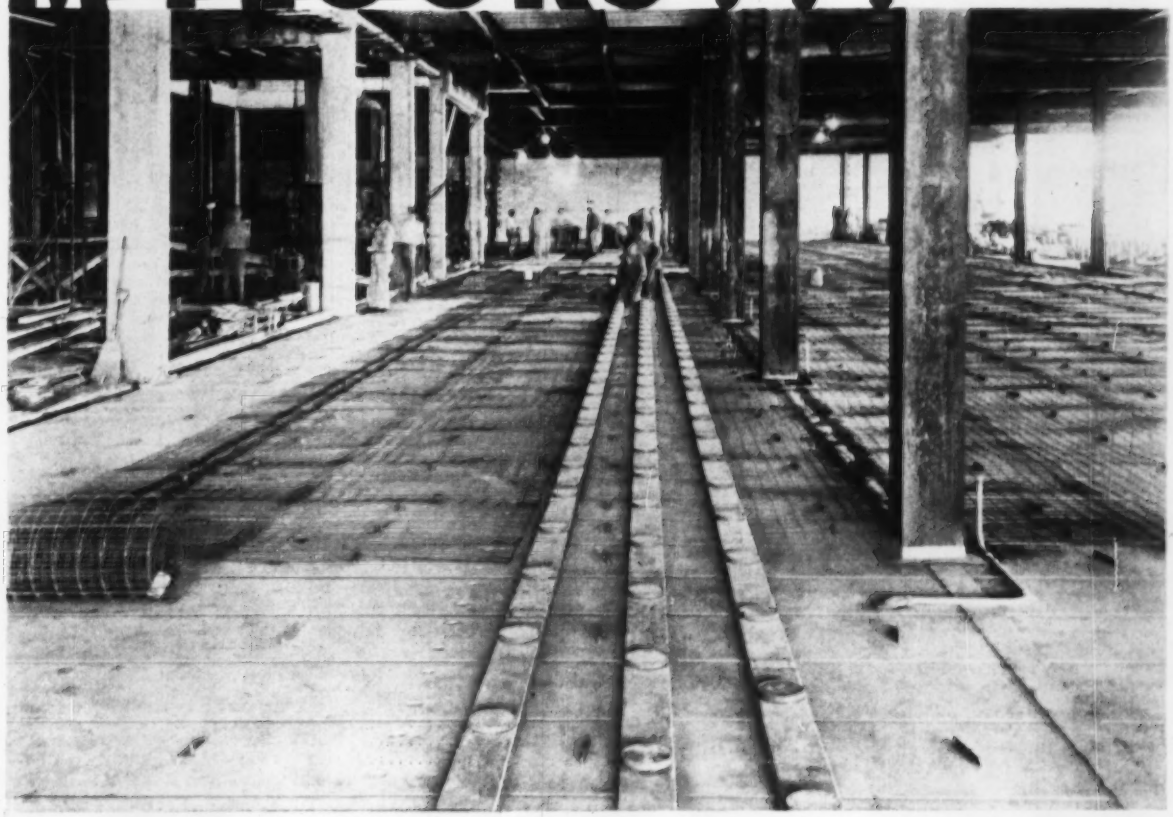
▲ **Fibrocemento C.A.**, Primera Ave. Sta. Eduvigis, Los Dost Caminos, Caracas, Venezuela, CA $2,991,622 (3 bidders) 0.75 mi. Avenida Notre-Sur 7, six lanes with split level crossing at Urdaneta Ave., CARACAS, VENEZUELA. Ministry of P. Wks., Caracas, Venezuela.

BUILDINGS—LB & CA

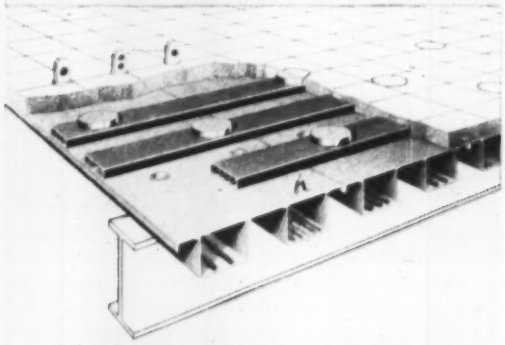
▲ **Eneca S. A.**, Torre e Veroes 25, Edificio Sta., Marie, Caracas, CA $1,790,771 (4 bidders) 14 story cylindrically shaped HOTEL, Mount Avila, near here, VENEZUELA. Ministry of P. Wks., Caracas, Venezuela. CD 6/28/46.

(Proposal Advertisements see p. 121 to 124)

M-FLOORS . . .



Provide Electrical Availability in Every Sq. Ft. of Floor Surface



Cross Section of an Electrified M-Floor constructed with Mahon M-Floor Section M2 and energized with a Three Header Duct Electrical Distribution System. M-Floor Cel-Beam Sections are available with either Two or Three 6" wide Cel-Beams in a 24" width, and with One Cel-Beam in a 12" width.

. . . more important, Cel-Beams in electrified M-Floors provide the unlimited built-in raceway capacity which insures a building against electrical obsolescence in years to come. When you have decided on Cellular Steel Floor Construction, call in a Mahon engineer and have him show you the many advantages engineered into the design of M-Floor Cel-Beam Sections. You get a higher Section Modulus with less weight in M-Floors . . . Cel-Beams are wide enough to permit 4" diameter access handholes between Electrical Header Ducts and Cel-Beam Raceways, yet they are narrow enough to provide adequate and evenly distributed beam web support for the top plate. These are important features . . . features which have direct and far-reaching effects not only on initial building costs, but also on the cost of any subsequent additions or changes in electrical and communication circuits throughout the life of the building. Get the facts before you select a particular Cellular Steel Sub-Floor for your next building. See Sweet's Files for complete information, or write for Catalog M-56.

THE R. C. MAHON COMPANY • Detroit 34, Michigan

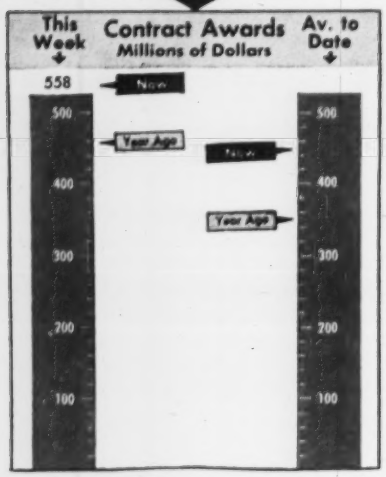
Sales-Engineering Offices in Detroit, New York and Chicago • Representatives in Principal Cities

Manufacturers of M-Floors (Electrified Cel-Beam Floor Systems), Insulated Metal Walls and Wall Panels, Permanent Steel Floor Forms, Steel Roof Deck and Long Span M-Decks, Rolling Steel Doors, Grilles, and Underwriters' Labeled Automatic Rolling Steel Fire Doors and Fire Shutters.

MAHON

Construction Scoreboard

Activity this Week



AMOUNT OF CONTRACTS LET

By Ownership	This Week	Cum. 19 wks. 1956	Chge %
	$ millions		
Federal	$56.7	$656.2	+2
State and Municipal	130.5	2,292.8	+25
Total Public	187.2	2,949.0	+19
Total Private	370.5	5,619.6	+34
U. S. Total	$557.7	$8,568.6	+29
By Type of Work			
Waterworks	$5.5	$109.5	+17
Sewerage	6.8	234.2	+61
Bridges	9.2	216.0	+28
Highways	53.6	833.6	+15
Earthwork, Waterways	41.2	260.5	+65
Buildings:			
Public, Excl. Hsg.	50.3	715.4	+15
Public Housing	3.0	145.9	+44
Private Housing	98.3	2,362.2	−4
Commercial	31.7	733.7	+21
Industrial	221.8	2,243.8	+151
Unclassified	36.3	713.8	+2
U. S. Total	$557.7	$8,568.6	+29

NOTE: Minimum size projects included are: Waterworks and waterways, $44,000; other public works, $73,000; industrial buildings, $93,000; other buildings, $344,000.

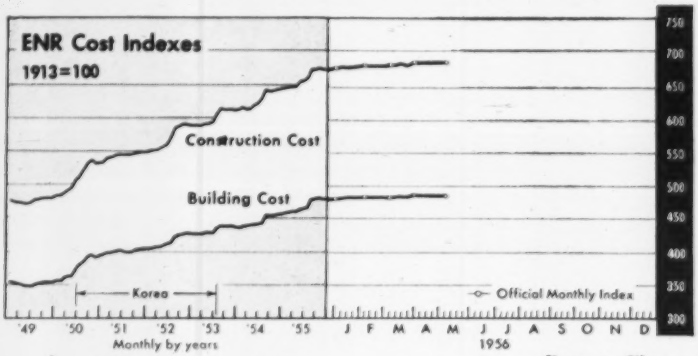
NEW CAPITAL FOR CONSTRUCTION

	Week of May 3	Cum. 18 wks 1956	Chge '55-'56
	$ millions		
Corporate Securities	$189.0	$1,328.2	+17
State and Municipal:			
All Except Housing	112.4	1,582.4	+11
Housing	...	20.3	−56
Federal Loans	1.7	38.5	+26
Federal Aid	...	...	...
Total Nonfederal	$303.1	$2,969.5	+12
Federal Appropriations:			
In U. S.	...	$34.4	...
Outside U. S.	...	...	...
Total New Capital	$303.1	$3,003.9	+11

Cost Indexes as of Now

ENR INDEXES (1913 = 100), 20-cities' average	May 3 1956	Percent Change from last Month	Year
Construction Cost	688.43*	+0.8	+5.3
Building Cost	487.36*	+0.3	+5.2

*Official Monthly Index for May.
To convert above indexes to 1926 = 100: Divide Construction Cost by 2.080; Building Cost by 1.845.
1949 = 100: Divide Construction Cost by 4.770; Building Cost by 3.518.



WAGE RATES, 20-cities' average	May 3 1956	Percent Change from last Month	Year
Common	$2.148	+1.2	+4.8
Skilled (average 3 trades)	3.342	+0.7	+4.2
Bricklayers	3.611	+1.3	+3.9
Structural Ironworkers	3.317	+0.2	+4.1
Carpenters	3.098	+0.7	+4.6
MATERIAL PRICES, 20-cities' average			
Structural Steel (average 3 mills), per cwt	$4.600	0	+8.2
Lumber, 2x4 Fir, per M fbm	122.833	+0.2	+1.3
Lumber, 2x4 Pine, per M fbm	104.200	0	+6.3
Cement, bulk, per bbl	3.700	0	+4.2
Sand, per ton	2.427	+0.2	+4.5
Ready-mixed concrete, per cu yd	13.153	−0.3	+5.9

ENR INDEX REVIEW

	Construction Cost 1913 = 100	Construction Cost 1949 = 100	Building Cost 1913 = 100	Building Cost 1949 = 100	Volume 1913 = 100	Volume 1949 = 100
1955						
May	653.26	137.01	462.55	131.65	731	211
June	655.96	137.51	464.82	132.13	633	183
July	660.09	138.38	467.52	132.90	699	202
Aug.	672.24	140.92	478.03	135.89	508	147
Sept.	672.74	141.03	479.15	136.20	576	166
Oct.	673.89	141.27	479.99	136.44	628	182
Nov.	673.20	141.13	479.30	136.23	561	162
Dec.	673.13	141.11	478.70	136.08	544	157
Annual Average	**659.72**	**138.31**	**468.80**	**133.33**	**600**	**173**
1956						
Jan.	676.36	141.79	480.48	136.58	645	186
Feb.	680.21	142.59	483.08	137.32	736	213
Mar.	680.20	142.59	483.14	137.34	786	227
Apr.	683.28	143.24	485.56	138.02	764	221
May	688.43	144.32	487.36	138.54	...	...

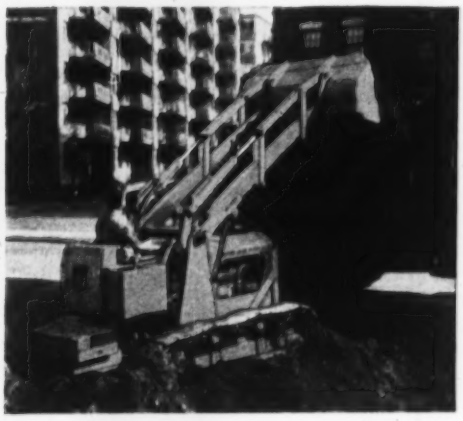
MATERIALS SHORTAGES

- **Cement:** New Orleans. Adequate but tightening in Chicago.
- **Structural steel:** Atlanta, Birmingham, Chicago, Cincinnati, Cleveland, Dallas, Denver, Detroit, Minneapolis, Philadelphia, Seattle, Montreal, Toronto.
- **Reinforcing bars:** Atlanta, Birmingham, Chicago, Denver, Detroit, Los Angeles, Philadelphia, Montreal, Toronto.
- **Douglas fir:** Detroit, Kansas City, New Orleans, New York, Seattle, Toronto, Chicago easing.
- **Southern pine:** Boston, Detroit, Kansas City, New Orleans, New York, Toronto.
- **Douglas fir plywood:** Chicago (sanded only), Kansas City, New Orleans, St. Louis, Toronto. Boston slight.

For ENR cost indexes for preceding years see insert chart ENR Sept. 29, '55. Extra copies 50 cents.

Want basements fast, for less money?

Let the OLIVER OC-12 deliver yours!



The OC-12 Loader has a maximum lift of 12'8"; dumping height of 10'4"; bucket roll-back of 37° and digging depth of 30½" below ground level. Available in two track lengths, two widths and a choice of shoes to meet any requirements.

Here's how the Oliver OC-12 is cutting basement digging costs so low. It's a three-point story:

1. ***Speed.*** Watch an OC-12 "size up" a basement job. You'll see maneuverability at its best with a fast, easy change of pace, forward and reverse, short turns, quick starts and stops—all with 53 drawbar h.p. to meet every need for power.
2. ***Easy handling.*** The hydraulic loader, designed specifically for the OC-12, has special roll-back type bucket that fills fast, levels automatically at any height without spillings, dumps fast and clean. Smooth hydraulic control cuts operator effort to the minimum.
3. ***Big capacity.*** Standard bucket is 1¼ yd.—the right size for any job. But work capacity isn't just a matter of bucket size. It's the fast, easy handling that keeps the bucket at peak capacity for bonus yardage.

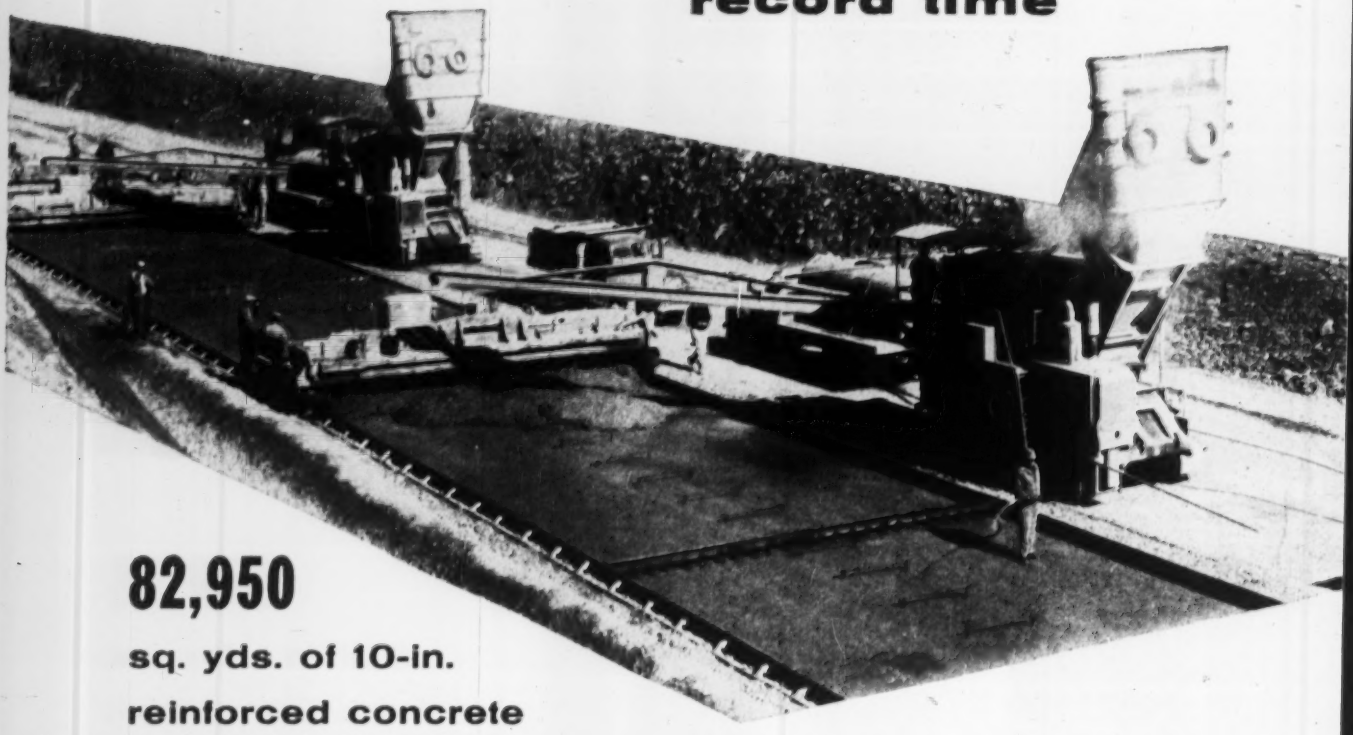
The Oliver OC-12 can definitely cut your costs on basement work—and dozens of digging, dozing, loading and winching jobs. Ask your Oliver distributor where you can see one in action. Or let him demonstrate—on your next job.

THE OLIVER CORPORATION
400 West Madison Street • Chicago 6, Illinois

OLIVER

a complete line of industrial wheel and crawler tractors and matched allied equipment

BLAW-KNOX Paving Equipment knocks out yardage in record time



82,950

sq. yds. of 10-in. reinforced concrete poured in 23 ten-hour working days

• This is the record Williams Paving Company made on the northeastern extension of the Pennsylvania Turnpike System. Williams set this record by paving in 24-ft. widths. Average pour was 3,606.78 sq. yds. per 10-hour day and the top day was 4,533 sq. yds. or 1,700 lineal feet of 24-foot pavement put down. Key to this high speed operation was Blaw-Knox paving equipment which included two MultiFoote Pavers, Spreaders and Road Forms.

You will set profitable records on your single- or dual-lane paving jobs, too, when you use Blaw-Knox "Complete Package" paving equipment. From subgrade to finished pavement, this equipment is designed for high speed coordinated work. More and more contractors all over the country are taking advantage of one-source, one-responsibility economies of Blaw-Knox "Complete Package" paving equipment and methods.

THE BLAW-KNOX
"Complete Package"

Cement Batching Plant • Aggregate Batching Plant • Precision Subgrader • Self-Aligning Steel Paving Forms • Curb and Gutter Forms • Base Paver • Road Widener • Trench Roller • MultiFoote Paver • Concrete Spreader • Concrete Finishing Machine • Clamshell Buckets • Concrete Buckets • Hi-Boy Trukmixers • Ready Mix Batching Plant

50th Anniversary
BLAW-KNOX
1906-1956

BLAW-KNOX COMPANY, Mattoon, Illinois
41 Charleston Avenue
CONSTRUCTION EQUIPMENT DIVISION
Cable Address: BLAW-KNOX, N. Y.

Contract Awards Set New Record for April

With the onset of the construction season, April gave the construction industry a heady spring tonic. Contract awards set a new April record of $1,868.7 million. And, on a weekly basis, April's average of $467.2 million per week came within 2% of matching the $475.8 million per week pace posted in record-breaking March of this year.

The traditional spring pickup in public works activity helped to spark the month's activity as waterworks, sewerage, bridges, public housing and unclassified public works shot ahead of the March figures.

Private construction's total of $1,266.4 million in April set a record for the month, topping April of last year by a substantial 52%. Private work awarded in the first four months adds up to more than $5 billion, 37% ahead of the record set last year.

Mass housing and industrial building are the driving forces in the boom for private construction.

April added another $558 million in industrial building awards to the already-bulging total, which now runs close to $2 billion for the first four months. Industrial building has grown so rapidly this year that it is now head and shoulders above all other categories in its gains over 1955, running 147% above the comparable 1955 period.

More than half of the huge volume of industrial building contracts awarded in the first four months were for projects in three regions—the Middle West, Far West and West of the Mississippi. All three of these areas more than doubled their activity in comparison with the first four months of 1955.

The most impressive regional industrial building gain over 1955 is the 500% increase reported for the Far West. But this percentage gain can be explained in part by the comparatively low level of industrial building contracts in the Far West area during the first four months of last year.

From a dollar standpoint, the Middle Atlantic region is turning in the best performance in industrial building. The $564 million in contracts reported for the first four months of this year is 160% above the comparable '55 period—which was itself a record.

While the importance of industrial building cannot be ignored in the current boom, it is the surprising strength of mass housing that has some observers staring in disbelief. For three successive months, private mass housing contracts, as reported by ENR, have topped the half-billion mark. And, the total for the first four months is now more than $2 billion, 1% ahead of the same months in record 1955.

Biggest gains over 1955 appear in the West of the Mississippi and Far West regions. But New England is an impressive 28% ahead of last year, with a four-month total of $56 million in mass housing awards.

Not all regions are doing as well in mass housing this year. While the Middle Atlantic states still command the top position in point of dollar volume, the region's $705 million in contracts is 13% under 1955. And, the South, with $44 million in awards, has witnessed a 64% drop-off in mass housing activity in comparison with the first four months of last year.

Commercial building has had a steady month-to-month decline in volume since January's high point of $198 million. But April's $119 million in awards was 4% better than April 1955 and contracts for the first four months still are a notable 30% ahead of last year's record activity.

The widespread April gains in public works contracts let at the state and municipal level were not matched by federal awards which dropped 22% from March to April, and were also 22% under April 1955.

While highway contracts in April dipped 1% below March, this category still remains strong—and promises to get even stronger because of the expanded federal-aid road bill now moving through Congress.

Even without such future support, highway contracts are running 20% ahead of the first four months of 1955.

(*B&F continued on page 113*)

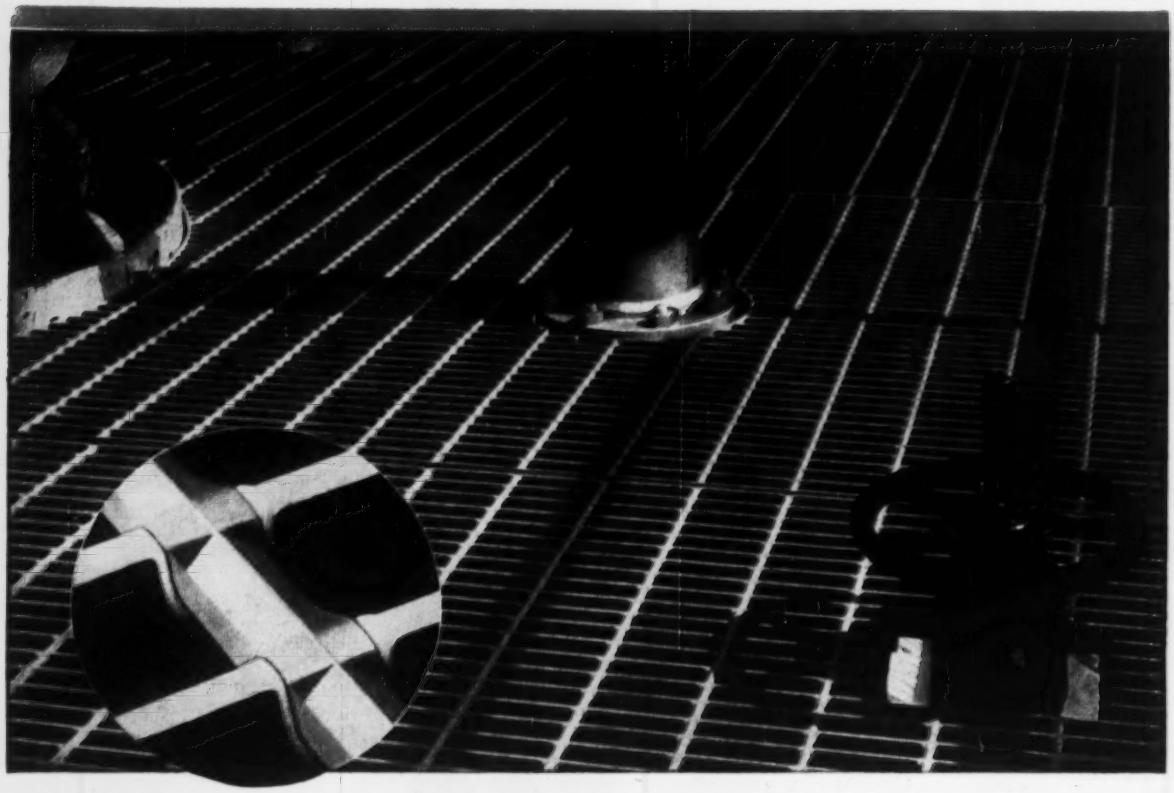
ENGINEERING CONSTRUCTION CONTRACTS—APRIL 1956

ENGINEERING NEWS-RECORD reports continental U. S. construction projects of the following minimum costs—Waterworks, excavation, drainage and irrigation, $44,000; other public works, $73,000; industrial buildings, $53,000; other buildings, $344,000.

Four Weeks—Thousands of Dollars (000 Omitted)

	April, 1956						U. S. Cumulative Four Months		% Change	Canada April
	New England	Middle Atlantic	South	Mid-West	West of Mississippi	Far West	Total U. S.	1956	1955	'55 to '56	1956
Public Works											
Waterworks	318	1,027	3,118	1,186	7,863	7,544	27,386	100,261	84,685	+18	637
Sewerage	710	8,522	9,334	10,633	6,166	5,063	40,488	215,253	130,095	+65	5,439
Bridges	8,957	10,197	4,337	2,311	8,351	13,758	47,911	192,759	151,217	+27	2,265
Earthwork and waterways	2,522	2,600	3,615	1,211	12,985	13,630	36,563	215,009	141,848	+52	31,364
Streets and roads	14,303	26,434	24,910	38,935	68,121	19,651	192,354	739,481	617,771	+20	3,000
Public buildings, residential	422	23,172		1,632	3,161	509	28,896	132,032	84,731	+56	6,576
Other public buildings	13,747	24,137	18,188	27,704	28,867	17,823	130,466	619,136	548,822	+13	17,823
Unclassified	6,876	38,931	14,805	5,904	18,357	13,351	98,224	397,730	401,804	− 2	3,714
Total public	47,915	138,020	78,607	92,516	153,871	91,359	602,288	2,611,661	2,163,973	+21	70,848
Federal government (included in above classifications)	8,967	20,202	18,395	3,382	20,470	28,877	100,293	578,661	551,114	+ 5	15,133
Private											
Bridges								806*	1,500	−46	
Industrial buildings	7,287	35,591	86,602	214,091	151,125	63,721	558,417	1,922,844	778,370	+147	55,349
Mass housing	7,218	125,843	20,824	164,419	74,971	126,079	519,354	2,161,567	2,145,253	+ 1	11,500
Commercial buildings	16,777	23,808	6,981	29,982	20,268	20,960	118,776	673,616	516,542	+30	13,654
Unclassified		3,557	303	4,365	37,027	24,613	69,865	251,469*	210,425	+20	7,771
Total private	31,282	188,799	114,710	412,857	283,391	235,373	1,266,412	5,010,302	3,652,099	+37	88,364
Total Engineering Construction:											
April, 1956—4 weeks	79,197	326,819	193,317	505,373	437,262	326,732	1,868,700				159,212
March, 1956—5 weeks	163,649	828,921	176,721	395,684	422,140	392,122	2,379,237				176,666
April, 1955—4 weeks	68,608	605,820	216,977	275,934	304,318	177,390	1,449,047				99,263
Four Months—1956	447,680	2,206,635	713,886	1,489,404	1,733,094	1,031,264		7,621,963		+31	626,990
Four Months—1955	282,371	1,744,328	673,111	1,234,971	1,253,401	627,880			5,816,072		485,330
% Change '55 to '56	+59	+27	+6	+21	+38	+64					+29

* Revised $45,000,000 transferred from Bridges—Private to Unclassified—Private



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When you use Gary Welded Grating, it's delivered to you ready for installation. Every opening—around pipes, bases, stair wells—is cut exactly to your specifications. You can be sure it will fit—installation will be easier—you'll save time and expense. And, it's the neatest appearing open steel flooring obtainable. Resistance welding is accomplished by synchronized application of hydraulic pressure and electric current, resulting in a forged weld, with properties far superior to fusion welds, both mechanically and metallurgically. Tops of all bars are flush—for greater safety. Get the complete story of Gary gratings, stair treads and decking by writing for Catalog E-56.

Standard Steel Spring Division

ROCKWELL SPRING AND AXLE COMPANY

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Paper weight size sample sent free when requested on your company's stationery.

Money Market Enters Critical Period

Some of the top economic experts in the Eisenhower Administration think the next couple of months may show that the recent Federal Reserve hike in the discount rate was premature and may not have been needed at all.

If these experts are right, there is a chance that the Federal Reserve will swing the pendulum back to an easy money policy sometime in July—with important ramifications for construction.

The importance of the next 60 to 90-day period is that by that time it should be clear who is right—Federal Reserve Board members who see inflation as the main threat, or business analysts in the Council of Economic Advisors and the Treasury Department who have disagreed with Reserve's decision.

Economists in the Council of Economic Advisors and their counterparts in the Treasury Department do not fear sharp recession. But they believe that the chance of a slight business dip in the months ahead is at least as great as chances that a serious inflationary trend will develop. Their point is that that the Federal Reserve should have waited at least another month or two before taking any action.

Construction Will Be Hit Hard

One point the wait-and-see group makes is that construction, which has played a major role in the nation's booming economy, will be hard hit by the tighter money market—even though it was not one of the targets of the anti-inflation move.

The big reason for the Federal Reserve's action in approving higher discount rates was that board members felt corporate borrowing had become excessive. Much of the business borrowing was for the build-up of metals inventories, particularly steel. A sizable chunk was borrowed for tax payments.

And, business has been borrowing heavily for general expansion. This point is confirmed by ENR's reports of corporate securities sales for construction. For the first 18 weeks of this year, ENR's figures show that business has borrowed 17% more money to finance construction expenditures than in the comparable 1955 period.

Higher money costs have had a marked effect on offerings of tax-exempt municipal bonds for public works construction and have affected the sale of corporate securities for private work.

Pennsylvania Electric, for example, which had earlier announced plans for a $25-million bond issue, now reports that it will cut the amount in half. And, Portland Coke & Chemical trimmed a proposed $16.5-million bond issue, and sold only $3.4 million in bonds.

Unsettled conditions in the money market generally led to a decision by Long Island Lighting Co. to postpone a $12-million preferred stock offering.

Impact on Municipal Bonds too

The higher interest rates in the money market also hit the tax-exempt municipal bond field. Impact of the change in the discount rate was felt more quickly and perhaps harder by the municipal market because it came at a time when unsold issues were beginning to pile up in dealers' portfolios.

Timing is also a factor in this. When local authorities reject bid offers for their bonds because they feel the interest rate is too high, or when they are under pressure to withdraw prospective bond offerings from the market—as some have been—they cannot quickly turn around a few months later and take advantage of an easier money market.

There are a number of reasons for this. When an issue is withdrawn from the market in May, for example, and then later rescheduled for August, certain legal steps must be repeated. Some of these steps are time consuming.

And, sometimes when the delay in selling the bonds stretches over several months, local authorities can get caught by rising construction costs which rule out the original estimates on which the first bond issue was based.

A New Squeeze on Housing

Housing, of course, is generally the first major segment of the construction industry to be hurt by tighter credit. In the present market, where demand for mortgage funds has exceeded available loan funds in some areas for four or five months, any move to make money more costly can have a severe effect.

Mass home builders tend to be wary when mortgage money is harder to get, because they cannot build and sell houses unless they are assured that prospective buyers will be able to get mortgage loans.

Construction loans to finance homebuilders (as well as other builders) get more expensive and more difficult to obtain in a tight market because these loans bear a close relationship to short-term money for industry in general—and the builder must compete for funds from the general pool.

If the tight money situation continues through the early summer, homebuilders can be expected to reduce their operations even if money gets cheaper and more plentiful later, homebuilders may not be able to accelerate their operations enough to make up for these cuts. For one thing, builders who have materials lined up now may have to get back in the waiting line if they try to step up their activities in the fall.

This touchy problem of housing is causing the government's fiscal experts some concern. The experts aren't sure just what is happening to housing right now. They are concerned, for one thing, because April work put-in-place figures for housing are expected to show a slight upturn (adjusted on a seasonal basis), while April housing starts look now as though they will be at March's adjusted annual rate figure of 1,100,000 that would be a far cry from last year's rate and would fall far short of the 1,300,000 units which have been predicted by such top housing officials as HHFA Administrator Cole.

Addition to the confusion is the fact that the put-in-place figures for residential building reflect higher prices and bigger homes. But, the experts don't know just how much of the rise is attributable to these factors.

So, the debate over housing won't be settled in the next few weeks. It may be mid-summer before the pattern for the whole year takes definite shape.

While the ups and downs of housing will be watched as carefully as an amateur meteorologist's first barometer, there are some other factors that will be appraised constantly in the months ahead.

A Close Watch on Borrowing

Business borrowing heads the list. It was probably the biggest single reason that the Federal Reserve approved higher discount rates. The

(Continued on page 117)

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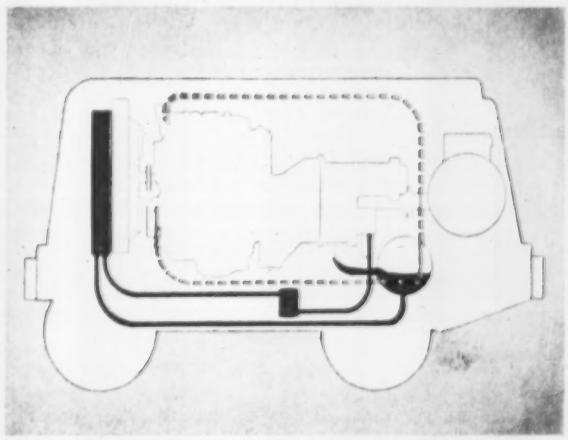

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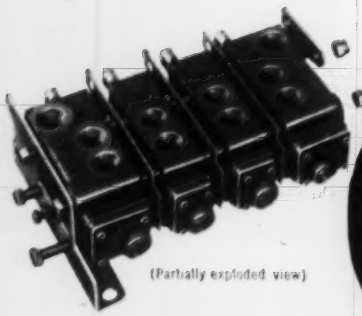

(Partially exploded view)

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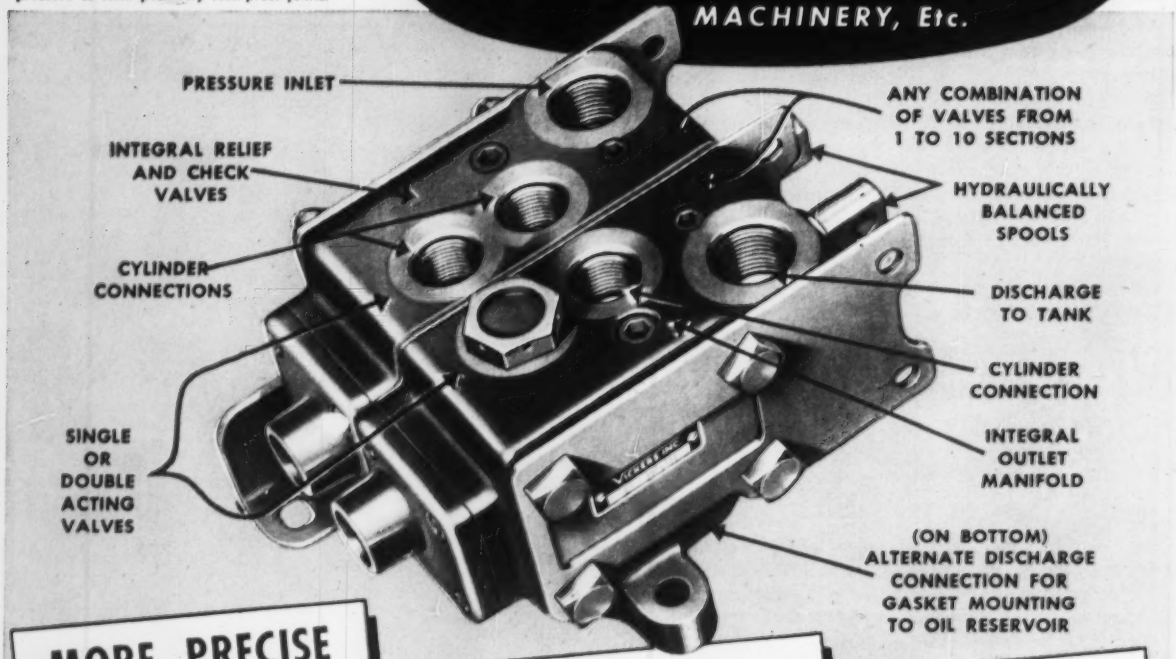
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ENGINEERS AND BUILDERS OF OIL HYDRAULIC EQUIPMENT SINCE 1921

Federal Reserve members apparently felt that this heavy corporate borrowing was inflationary. But some of their critics do not agree with this argument.

Some of the money that industry borrowed was used to pay taxes that were due March 15. One major manufacturer of electrical products reportedly borrowed $150 million, most of it presumably to pay its taxes. But such borrowing, say some of the economists, is to replace money already spent for expansion; it does not forecast future expansion and therefore is not inflationary.

And, a large amount of the money borrowed by industry undoubtedly financed larger inventories in the metals-processing fields. This is explained by the general feeling that a substantial price hike for steel, maybe as much as $12 a ton, is certain to come after the new wage contract is signed with the steelworkers.

Quick Money Needs Past a Peak?

With these two points in mind, CEA and Treasury fiscal experts raise a big question. Tax borrowing is past its seasonal peak. Borrowing for steel inventory obviously cannot be continued much longer. And without these two temporary factors, what will be the demand for business loans?

The Federal Reserve had other reason for the change in money rates. The feeling is that industry's ambitious plans to boost plant and equipment expenditures played a major role in the central bank's decision. Here again, it depends on which figures are used—and how they're interpreted. Some agree with the Reserve that the rash of industrial expansion could be inflationary.

Adding up the various factors even the critics of the Federal Reserve agree that serious inflation could become a threat—later in the year. But they are still certain that the central bank should have waited until some of the fog lifted. That much is now history. But the same economists hope even more that if the soft spots do continue—or get worse—that the Federal Reserve will act as quickly and as effectively to make money easier as it did to make it tighter.

They will be watching closely for that reason in the next 60 to 90 days. And, construction, with a big stake in the outcome, will be watching, too.

Costs Set Record

Wage agreements drive ENR indexes to new highs

The pressure of new wage contracts has ended a month-long period of stability for building and construction costs.

Common laborers in four of the 20 cities included in ENR's Building and Construction Cost Indexes won pay increases of 10 to 15 cents an hour, while scattered increases for skilled trades ranged from 7.5 to 25 cents.

Because of higher labor rates, ENR's 20-Cities Construction Cost Index climbed five points to a new high of 688 (1913 = 100), while the Building Cost Index edged up one point to 487, also a new record.

Construction costs, as measured by the ENR index, have gone up 1.8% in the first four months of this year and are now 5.3% higher than a year ago. The Building Cost Index is up 1.4% for the first four months.

The new contracts signed by the common laborers indicate a pattern of bigger increases this year than in 1955. The 15-cent pay raise won by common

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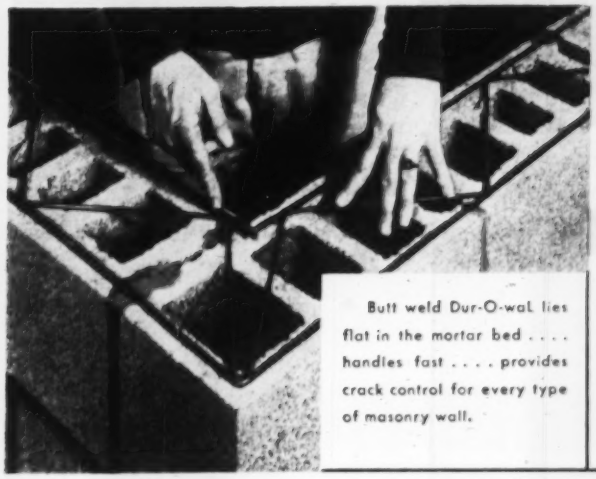

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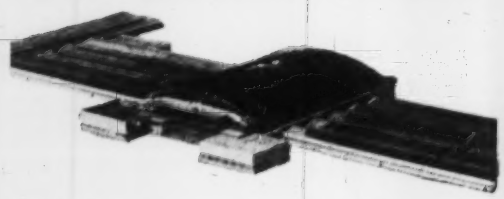

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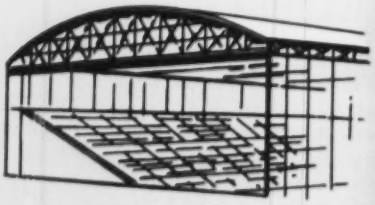

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. . . Business and Finance

laborers in Boston is nearly double the 8-cent raise won last year. San Francisco's 15-cent hourly increase compares with 12.5 cents last year, while common laborers in Los Angeles received a 10-cent hourly boost, topping 1955's pay increase of 8.5 cents an hour. Minneapolis common laborers settled for a 10-cent increase, matching last year's gain.

It is not as easy to find a pattern for pay increases won by the skilled trades. A 25-cent hourly increase for Boston bricklayers is well above the 16.5 cents an hour won last year. But Minneapolis bricklayers, carpenters and structural ironworkers received 10-cent increases this year—just as they did in 1955. While the May pacts signed in Boston and Minneapolis showed labor doing as well or better than in 1955, trades in three other cities took smaller pay raises.

The 10-cent pay boost for Los Angeles carpenters, the 12.5-cent raise for San Francisco bricklayers, and the 7.5-cent increase for Kansas City bricklayers all were less than the pay increases they received last year.

Business Briefs . . .

• **Atomic power for co-ops**—The Rural Electrification Administration is trying to rush the processing of loans for two of its members who want to get into the Atomic Energy Commission's power demonstration program. REA says it won't draw any line between loans for conventional power plants and atomic power plants. If the loans are approved to the Elk River, Minn., and Big Rapids, Mich., co-ops, others may follow suit quickly.

• **Higher costs predicted**—Prices are still rising rapidly on raw materials, non-ferrous metals and electrical equipment—with no end in sight—purchasing executives reported in the latest survey by the National Assn. of Purchasing Agents. Inventories are mounting against the possibility of strikes and higher prices.

• **$2 billion to spend**—American Telephone & Telegraph Co., which spent $1.64 billion for construction in 1955, reported it will top its own record this year. AT&T expects to become the first company in history to spend $2 billion for construction in a single year.

• **Hilton Hotel for Thailand**—Financing is not expected to be much of a problem for a new hotel planned for Bangkok, Thailand, by hotelman Conrad Hilton. The project will be sponsored by Queen Rambhai Bhami.

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For putting the brakes on state mergers . . .

Building Trades Are Rebuked by AFL-CIO

The jurisdictional dispute between the building trades and industrial unions erupted in the AFL-CIO's high echelons last week, when the new federation's Executive Council met in special session to consider the controversial mutual assistance pact between the International Longshoremen's Association and the teamsters union.

In a stern—and perhaps futile—rebuke to the building trades, the Council unanimously agreed that an attempt by the building trades to block AFL-CIO mergers on the state level, until agreement is reached on the respective jurisdictional claims of craft and industrial unions, is a violation of the merger agreement and of the AFL-CIO constitution. The Council instructed President George Meany to direct the building trades to rescind their action and voted to notify state and local central bodies to proceed with AFL-CIO mergers, now completed in five states only.

Big Test for Unity

At week's end, there was little indication that the building trades would back down. It looked as if the stalemate would continue—at least until the building trades' next meeting at the end of this month, or until the AFL-CIO Executive Council meets on June 5. Although the Council took the position that the building trades had exceeded their authority because regional and local affiliates are powerless to settle jurisdictional conflicts, it apparently chose to overlook the fact that the building trades had selected an effective weapon to protect their traditional claims by openly calling local attention to one of the basic elements involved: The assurance that the jurisdictional interests of the building trades would be protected in the merger, an assurance which was part of the inducement to the building trades to lend their support to the merger.

At the same meeting, the Executive Council voted to continue its investigation of the now-dead alliance between the teamsters and the ILA.

Both issues represent the first real test of labor unity and out of the meeting came this: While organized labor continues to seek unity as its ultimate goal, there's still bitter disagreement as to how unity should be achieved.

Issue in the Open

State mergers were injected into the critical jurisdictional dispute between craft and industrial unions on April 26, when the officers of the Building and Construction Trades Department and 18 of the international presidents of its 19 affiliates voted, in defense of their traditional claims, to direct their local affiliates to oppose AFL-CIO mergers in the remaining 43 states, until a satisfactory written agreement is reached with the Industrial Union Department on "who does what" on in-plant industrial construction (ENR May 3, p. 112).

The action came on the heels of a two-day meeting of the joint committee of the Building Trades and Industrial Union Departments, which had attempted unsuccessfully to iron out the differences on construction—as well as installation and maintenance—work in industrial plants. The increasing performance of such work by industrial employes has been of growing concern to both contractors and construction unions—and the building trades reportedly saw no satisfactory settlement in the patchwork, plant-by-plant type of solution, which IUD apparently favors.

It's this same inability to find a common meeting ground that's largely resulted in the building trades' failure to obtain AFL-CIO support for their proposed Taft-Hartley amendments. On the question of pre-hire contracts, which the building trades want to see legalized, for example, one of the biggest roadblocks has been lack of a mutually satisfactory legislative definition of "construction" for jurisdictional purposes. This lack of support on the legislative front gave added impetus to the open break last week.

Some Growing Criticism

And both the teamster problem and the jurisdictional issue have worked together to serve as a sounding board for growing criticism of the way the new AFL-CIO is being run.

One of the most outspoken critics has been the 835,000-member carpenters union. Here are some examples:

- Maurice A. Hutcheson, General President: "Dangling suspensions and expulsion threats may make hot headlines, but that is not the way we are going to organize the disorganized. The teamsters' pact with the International Longshoremen's Association was undertaken in an organizing drive, and such agreements are nothing new in the labor movement. We have mutual assistance pacts with a number of unions."
- Charles Johnson, Jr., General Executive Board member: "We're for the merger of the AFL-CIO, but sometimes we feel we're being pushed a little too far . . . we will continue to fight for free trade unions in America and will resist czarism in any sense."

Hutcheson and teamsters' president Dave Beck, both of whom signed the building trades' resolution and who are members of the Executive Council, did not attend last week's meeting. Other building trades members who did attend were the bricklayers' Harry Bates, one of the architects of the merger and the only construction union president who didn't sign the resolution; Charles MacGowan, president emeritus of the boilermakers; and Joseph Keenan, secretary of the electrical workers.

Question of Principles

In refusing to drop the teamster problem—despite Beck's claim that the issue is now academic—the Executive Council gave a vote of confidence to President Meany for his firm handling of a ticklish situation.

The mutual assistance pact was negotiated under the leadership of James Hoffa between the Eastern, Southern and Central Conferences of Teamsters and the ILA, which had been expelled from the AFL in 1953 on charges of racketeering. It has been openly criticized by the teamsters' Western Conference, which threatened to secede from the union and remain with the AFL-CIO if expulsion of the teamsters had been the outcome. And the pact worked di-

rectly against the interests of the AFL-CIO International Brotherhood of Longshoremen, a union subsequently chartered by the AFL to work in the jurisdiction of the ILA. After the legality of the alliance was questioned, the teamsters dropped one phase of it—a $400,000 loan to the ILA—and later the ILA agreed to call the whole thing off.

Although the pact is dead, the question of principles remains, and this has been put on the June 5 agenda of the Executive Council. According to President Meany, the real question is this: "Can a union, a member of the AFL-CIO, have a working alliance, or an organizing alliance, with a union outside of the AFL-CIO that could work to the detriment of a member of the AFL-CIO?"

Wage Demands: High and Firm

"Too high" is the response of many contractors to current wage demands of the building trades as the collective bargaining season for the construction industry heads toward the final stretch.

Stalemates in wage negotiations across the nation have thrown local construction into a costly tailspin in many areas, with parts of Texas and Ohio among those hardest hit. Emphasis has been on higher basic rates rather than on fringe benefits, and no particular pattern has emerged.

Here's how some of the local scenes looked to ENR last week:

California

Cement masons and laborers in 46 northern counties are given a 15-cent increase in new contracts with the Northern and Central California Chapters of AGC. Effective last week, the one-year contract with cement masons puts the basic rate at $2.99½. In addition to their basic boost, laborers, who had asked for a 25-cent increase, will now get a $3.00 travel allowance for work on remote jobs; their new rates are $2.32½, $2.42½ and $2.57½; although the contract runs until 1961, it provides for an annual wage review.

AGC negotiations are still in progress with the carpenters, now getting $3.00 an hour under a contract that expires June 15; the union has started a drive for a 7-hour day with no cut in pay. Pile drivers, now getting $3.13 plus 10 cents in health and welfare, are also asking for a 7-hour day; their contract has been extended 45 days with a 10-cent boost in pay.

Meanwhile, the Peninsular Tile Contractors Association and 46 independent contractors have agreed to raise tile layers in 16 northern counties 12½ cents an hour, making the basic rate $3.22½. The contract also calls for a 9-cent vacation fund contribution, which will be upped another 5 cents next April 1. San Francisco bricklayers have won a 10-cent increase (making the basic rate $3.75) plus another 2½ cents in welfare.

Florida

Rejecting a 10-cent offer in two installments by members of AGC, iron workers in Local 597 have struck all construction jobs in northeast Florida and southeast Georgia. Now getting $2.55 for rodmen and $2.81 for structural iron workers, the union's asking for 25 cents now and another 10 cents in six months. Stating that the strike is reluctantly undertaken, the union says its workers are being paid 20 to 30 cents under the scales of other unions.

Illinois

Building construction in central Illinois has all but stopped as roofers, iron workers and carpenters struck to enforce their demands for higher wages.

The carpenters (Local 16), who've been out since April 1, are asking for 22½ cents; they're now getting $2.82½. Members of Ironworkers' Local 46 want 47½ cents added to the present scale of $3.07½. And roofers in Local 112 are seeking a 25-cent boost to raise the present minimum to $3.15.

Ohio

Construction came to a halt in the Cleveland area last week, when more than 30,000 workers in 17 trades, seeking a 25-cent boost, went on strike after negotiations broke down with the Building Trades Employers Association. The BTEA has offered 15-12½-12½ under a three-year contract; homebuilders 15 and 10 in a two-year contract. Bricklayers and electrical workers, negotiating separately, have turned down offers of 15-12½-12½ in three-year contracts and are asking for 20 cents now plus 5 cents more for welfare.

New York

The building trades in Buffalo opened their negotiations with a united front. The goal: an across-the-board increase of 25 cents for all trades. Several of the unions have extended their contracts instead of striking. As negotiations progressed, it looked as if electrical workers would be the first to settle and would agree to a one-year contract granting most classifications a 15-cent boost.

In the western part of the state, the Southern Tier Builders Association of Olean has signed its first area-wide (four county agreement with six of the trades:- carpenters, laborers, teamsters, painters, operating engineers, and iron workers. Three-year contracts with the carpenters, painters and laborers will achieve uniform area rates for each of the trades by 1959, when the rates will be $3.25, $3.10 and $2.50 respectively. Increases range from 15 to 50 cents.

Pennsylvania

In Philadelphia, Steamfitters Local 420—the only one of the major unions negotiating this year—signed a three-year contract with a 50-cent wage boost that will raise the basic rate to $4.00 on October 31, 1957. The increases are: 25 cents now, 15 cents next May and 10 cents the following October; wages may be reopened May 7, 1958. Other major unions are at mid-point in two-year agreements.

Texas

The Sabine area of Texas has been strike-bound since April 1, when contracts with pipefitters, millwrights, teamsters, piledrivers, ironworkers and engineers expired. Claiming that 6¢ had already been set as a pattern by pay boosts to petrochemical and refinery employes, the unions have asked for 17½ cents in a one-year contract. Some have indicated the price of a two-year contract would be 17½ and 15.

Contractor groups—Sabine area Construction Committee, AGC and Gulf Coast Piping Contractors Association—have been plugging for two or three-year contracts. Said management spokesmen: "We have lost 27 weeks of work in four years due to strikes and we definitely want Labor stability." A few contractors have independently signed for 17½ cents, but the contractor groups have held for a two-year contract with 15 and 10.

HOW TO GET THE MOST FOR YOUR DOLLAR IN INDUSTRIAL BUILDING

EN-R's July 5, 1956 issue will include a special staff report on new trends in industrial plant design. Leading industrial plant designers have been cross-examined. A special EN-R editorial task force is pouring in a deluge of material from the field—facts and figures about power plants, warehouses, refineries, textile mills, chemical plants, auto plants, "hot" plants, where radio activity must be controlled. And it's being produced by the team that turned out last year's award-winning EN-R report on schools.

Here are some of the areas you'll find covered in the July 5 issue:

Do you need a new plant?
Where do you put it?
How do you plan it?
How do you keep costs down?
What's new in noise control?
How good is your temperature control?
What kind of lighting to use?
What's new in electrical distribution?

It all adds up to a gold mine of dollar-saving ideas for plant owners and consultants and contractors who work with them. And not to be overlooked is the fact that this issue of EN-R will be crammed with interesting and useful advertising from the firms who supply the equipment, materials and services that play a vital part in keeping the industrial building boom rolling.

Remember—for a wealth of specific information on how to get the most for your dollar in industrial building, see the special report in the July 5 Engineering News-Record.

In building and construction . . .
if you're important, you either read

ENGINEERING
NEWS-RECORD

or you advertise in it . . . or both.

OFFICIAL PROPOSALS

Bids: June 5, 1956

Arlington, Virginia

ADVERTISEMENT FOR BIDS
CONSTRUCTION OF "LEE WATER PUMPING STATION" AND FOUNDATIONS FOR ELEVATED WATER STORAGE TANK

Sealed proposals for furnishing all materials and equipment and doing all work required for the construction of a water pumping station and foundations for a steel, elevated water storage tank, as described below, will be received by the Purchasing Agent in Room 212, in the Court House Building at Arlington County, Virginia, until 11:00 A.M., Eastern Daylight Saving Time, on Jun 5, 1956 and there publicly opened and read immediately thereafter:

STAGE II CONTRACT 6
CONSTRUCTION OF LEE WATER PUMPING STATION AND FOUNDATIONS FOR ELEVATED WATER STORAGE TANK.

1. Location: The work is located in Arlington County, Virginia, on county property at 24th St., north and North Woodrow Street.

2. Type of Work: The principle items of work include the following:

a. Construction of a water pumping station, complete, ready to operate.

b. Construction of concrete foundations for an elevated steel water storage tank.

c. Included in the above principal items is all clearing, excavation, back-fill, grading, concrete, masonry, structural steel, roofing, miscellaneous piping and appurtenances, operating equipment, electrical work, paving, walks, topsoil and seeding, etc.

3. Copies of Plans and Specifications, Information for Bidders, Bid Forms and other bidding and contract documents may be examined at the office of the Chief Engineer of the Water Division, County Court House, Arlington, Va.; at Dodge Reports, 500 F. Street, N.W., Washington, D. C. and at the office of ALEXANDER POTTER ASSOCIATES, CONSULTING ENGINEERS, 50 CHURCH STREET, NEW YORK 7, N. Y.

4. Copies of Plans, Specifications and Bidding Documents may be obtained from the Purchasing Agent in Room 213, Court House Building at Arlington, Virginia upon deposit of THIRTY ($30.00) DOLLARS PER SET.

Full refund will be made to actual bidders for return of one (1) set, in good condition, within two weeks after closing date for receipt of bids; refund for return of all other sets in good condition, WITHIN THE SAME PERIOD, will be Fifty (50%) percent of the deposit. No refund will be made for return of documents in poor condition or later than the two week period stipulated.

All bids must be on the form contained in the Contract and Specification.

Contractors, whether resident or non-resident in Virginia will be required to show evidence of a certificate of registration as required by Chapter 7 of Title 54 of the Code of Virginia before their bids will be considered if the bid is $20,000 or more.

All bids must be accompanied by a certified check or acceptable bidder's bond in an amount of not less than Five Per Cent (5%) of the amount of the bid, made payable to the Treasurer of Arlington County, as bid security.

The successful bidder will be required to furnish a Performance Bond conditioned upon the faithful performance of the Contract and upon payment of all persons supplying labor and furnishing materials on the construction of the work.

No bidder may withdraw his bid within Thirty (30) days after actual date of opening thereof.

The County Board of Arlington County, Virginia, reserves the right to reject any or all bids and to waive any informality in the bids.

ARLINGTON COUNTY, VIRGINIA
By: H. G. Bonney
Purchasing Agent

OFFICIAL PROPOSAL

RATE: $2.10 per line (or fraction) per insertion.

CLOSING DATE: 10:30 a.m. Friday for issue out following Thursday.

SEND COPY: Official Proposal Division, Engineering News-Record, 330 W. 42nd St., New York 36, N. Y.

OFFICIAL PROPOSALS

Bids: May 15, 1956

The Hydro-Electric Power Commission of Ontario

ST. LAWRENCE POWER PROJECT
CONSTRUCTION OF PROTECTIVE DYKE AND ASSOCIATED WORK AT THE PROPERTY OF THE CANADA STARCH COMPANY

SEALED TENDERS, in quadruplicate, addressed to the undersigned, 620 University Avenue, Toronto 2, Ontario, and clearly marked

"TENDER FOR ST. LAWRENCE POWER PROJECT CONSTRUCTION OF PROTECTIVE DYKE AND ASSOCIATED WORK AT THE PROPERTY OF THE CANADA STARCH COMPANY"

will be received up to 4:30 o'clock p. m., Eastern Daylight Saving Time, on

TUESDAY, MAY 15, 1956.

The work will consist principally of a timber crib dyke of varying width with steel piling driven in front of the cribbing. Earth, granular and rock fill is to be placed as specified. Other work connected with the dyke and existing equipment and buildings located at the site is included. Main materials including crib timber, steel piling and tie rods will be supplied by the Commission.

The successful tenderer will be required to commence work within fifteen (15) calendar days after date of receipt of notice of award of the contract and complete the work by December 31, 1956.

Copies of the tendering documents may be obtained on or after April 25, 1956 at the office of the Director of Supply, 620 University Avenue, Toronto 2, Ontario, on payment of twenty-five ($25.00) for each set. This charge will not be refunded.

Tendering documents may be inspected at the above address and at the offices of the following: the Commission's Field Office, Cornwall, Ontario; Power Authority of the State of New York, 270 Broadway, New York 7, New York; and Uhl, Hall & Rich, 230 Congress Street, Boston 10, Massachusetts.

Each tender must be accompanied by a certified cheque drawn on a Canadian chartered bank for a sum calculated as follows:

on tenders up to $500,000, the sum shall be 10 per cent of the total amount of the tender; on tenders over $500,000, the sum shall be 10 per cent of the first $500,000 and 5 per cent of the excess over $500,000. Provisions for the return of the cheques appear in the tendering documents.

The successful tenderer will be required to furnish a performance bond in the form approved by the Commission and issued by a bonding company licensed as such in the Province of Ontario and acceptable to the Commission for one hundred per cent (100%) of the total amount of the contract. The lowest or any tender will not necessarily be accepted.

E. R. EASSON
SECRETARY

Bids: May 29, 1956

Power Authority of the State of New York

ADVERTISEMENT FOR PROPOSALS
FOR
THE FURNISHING AND DELIVERY OF MAIN SWITCHBOARDS & APPURTENANCES
SPECIFICATIONS NO. PA-5-14616
ST. LAWRENCE CONTRACT NO. P38

NOTICE TO CONTRACTORS: The POWER AUTHORITY OF THE STATE OF NEW YORK will receive sealed proposals for the design, manufacture and furnishing of the "Main Switchboards, consisting of one Main Control and Relay Board of 27 panels, one Station Service Control and Main Recorder Board of 10 panels, four (4) Generator Differential Relay Boards and one (1) Transmission Line and Station Service Metering Board of 3 panels, together with appurtenances and accessories, and the delivery thereof, f.o.b. the Authority's classification yard, Massena, New York, as follows:

(1) If brought in person on the day of receiving bids until 10:30 A.M. Eastern Daylight Saving Time on the 29th day of May, 1956, 270 Broadway, Hearing Room C, 6th floor, New York, New York.

(2) If mailed in until 10:15 A.M. Eastern Daylight Saving Time on the 29th day of May, 1956 at the Authority's Office, 270 Broadway, Room 1300, New York 7, New York.

The proposals will be publicly opened and read aloud at the time and at the address given in (1) above. Bids will be entertained for the control, relay, recorder and metering boards, accessories and services in accordance with the bidding schedule. Erection at the site of installation will be done by Others but services of erecting engineers shall be provided by the manufacturer if and when required. Delivery of all switchboards, appurtenances and accessories will be required June 1, 1957.

Plans, Specifications and Proposal Forms for the work will be on file in the Authority's office and in the offices of the Engineer, Uhl, Hall & Rich, 230 Congress Street, Boston 10, Massachusetts, and The Hydro-Electric Power Commission of Ontario, 620 University Avenue, Toronto 2, Ontario, may be inspected by prospective bidders during office hours, and may be obtained from the Power Authority of the State of New York, 270 Broadway, Room 1300, New York 7, New York, upon application and prepayment of a fee of Ten ($10.00) dollars for initial set of Contract Documents and Five ($5.00) dollars for each additional set, no part of which will be refunded. Two sets must be returned with each bid.

Bids will not be restricted to American manufacturers.

Bids must be made in duplicate upon the proposal forms included in and bound with the Contract Documents. Bid deposit will be required with each bid in an amount not less than 10 percent of the gross sum bid.

The right is reserved to reject any or all bids.

W. S. CHAPIN,
General Manager

Bids: June 5, 1956

Arlington County, Virginia

ADVERTISEMENT FOR BIDS
REHABILITATION OF EXISTING WATER STORAGE RESERVOIR AT MINOR HILL

Sealed proposals for furnishing all material and equipment and doing all work required for the furnishing and erecting of an elevated steel water storage tank, as described below, will be received by the Purchasing Agent in Room 213, in the Court House Building at Arlington County, Virginia, until 11:00 A.M., E.D.S.T. on Jun 5, 1956, and there publicly opened and read immediately thereafter:

STAGE II—CONTRACT 8,
REHABILITATION OF EXISTING WATER STORAGE RESERVOIR AT MINOR HILL

1. Location: The work is located in Arlington County, Virginia, on County owned property at North Powhatan Street and North Rockingham Street.

2. Type of Work: The principal items of work include the following:—

Removal of wooden roof and brick masonry columns in existing reservoir, construction of new reinforced concrete floor slab and new flat slab reinforced concrete roof supported on new spirally reinforced columns and other related work.

3. Copies of Plans and Specifications, information for Bidders, Bid Forms and other bidding and contract documents may be examined at the office of the Chief Engineer of the Water Division, County Court House, Arlington, Va.; at Dodge Reports, 900 F Street, N.W., Washington, D.C. and at the office of ALEXANDER POTTER ASSOCIATES, CONSULTING ENGINEERS, 50 CHURCH STREET, NEW YORK (7), N.Y.

4. Copies of plans, Specifications and Bidding Documents may be obtained from the Purchasing Agent in Room 213, Court House Building at Arlington, Virginia upon deposit of THIRTY ($30.00) DOLLARS PER SET.

Full refund will be made to actual bidders for return of One (1) Set, in good condition, within two weeks after closing date for receipts of bids; refund for return of all other sets, in good condition, WITHIN THE SAME PERIOD, will be Fifty (50%) percent of the deposit. No refund will be made for return of documents in poor condition or later than the two week period stipulated.

All bids must be on the form contained in the Contract and Specifications.

Contractors, whether resident or non-resident in Virginia will be required to show evidence of a certificate of registration as required by Chapter 7 of Title 54 of the Code of Virginia before their bids will be considered, if the bid is $20,000 or more.

All bids must be accompanied by a certified check or acceptable bidder's bond in an amount of not less than Five Per Cent (5%) of the amount of the bid, made payable to the Treasurer of Arlington County, as bid security.

The successful bidder will be required to furnish a Performance Bond conditioned upon the faithful performance of the Contract and upon payment of all persons supplying labor and furnishing materials on the construction of the work.

No bidder may withdraw his bid within Thirty (30) days after actual date of opening thereof.

The County Board of Arlington County, Virginia, reserves the right to reject any or all bids and to waive any informality in the bids.

ARLINGTON COUNTY, VIRGINIA
By: H. G. Bonney
Purchasing Agent

Bids: May 24, 1956

City of Tampa, Florida

Sewer Improvements

Sealed proposals for construction of Vitrified Clay Pipe Sewers complete with all appurtenances, will be received at the regular meeting place of the Board of Representatives, City Hall, Tampa, Florida, until 2 P.M., E.S.T., May 24, 1956, there to be publicly opened and read aloud.

The work is divided into four Divisions. The Bidder may submit a proposal for any Division, all Divisions, or any combination of Divisions.

The approximate quantities of the principal work involved are as follows:

Div. XE23—14,800 Lin. Ft. of 8-inch V.C. pipe sewers.

Div. XE24—25,670 Lin. Ft. of 8, 10 and 12-inch V.C. pipe sewers.

Div. XE25—24,570 Lin. Ft. of 8-inch V.C. pipe sewers.

Div. XE26—68,350 Lin. Ft. of 8, 10, 12 and 15-inch V.C. pipe sewers.

Plans and Contract Documents may be examined at and obtained from the offices of the Bureau of Sanitary Sewers, 6th Floor, City Hall, Tampa, Florida, and the offices of Greeley and Hansen, Engineers, 220 South State Street, Chicago 4, Illinois. A deposit of $25.00 is required for each set of contract documents covering the four divisions.

City of Tampa, Florida
By Curtis Hixon, Mayor

Dated May 2, 1956

OFFICIAL PROPOSALS

Bids: May 22, 1956

Contract 461

ENGINEERING NEWS-RECORD
EXPLORATORY SHAFT,
ACCESS ROADS, ETC.

SEALED BIDS will be received by the Board of Water Supply, at its offices, thirteenth floor, 120 Wall Street, New York City, until 11:00 A.M. Eastern Daylight Saving Time (10:00 A.M., Eastern Standard Time) on Tuesday, May 22, 1956, for Contract 461, for the construction of a reinforced concrete exploratory shaft at the site of the proposed Cannonsville dam, the furnishing and installation of equipment for pumping ground water from the shaft, the pumping of ground water during the period of the contract, the construction of access roads, including two bridges, the excavation of shovel cuts and the construction of appurtenant structures. The shaft and access roads will be located in the Town of Deposit, Delaware county, New York.

At the above place and time the bids will be publicly opened and read. Pamphlets containing information for bidders, forms of bid and contract, specifications, contract drawings, requirements as to surety, etc., can be obtained in Room 1317, at the above address, upon application in person or by mail, by depositing the sum of five dollars ($5.00) in cash or its equivalent for each pamphlet. Within 30 days following the award of contract or rejection of bids, the full amount of such deposit will be refunded for each pamphlet submitted as a bid and a refund of four dollars ($4.00) will be made for each other pamphlet returned in acceptable condition. Arrangements will be made whereby prospective bidders desiring blueprints of the contract drawings for their own use may secure same, the cost thereof to be paid by them. For further particulars, apply at the office of the Chief Engineer at the above address.

IRVING V. A. HUIE, President, EDWARD C. MAGUIRE, HERBERT M. ROSENBERG, Commissioners, Board of Water Supply; BETTY COHEN, Acting Secretary.

U. S. Government

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. IDC-4689) will be received at Ephrata, Washington, until June 12, 1956, for furnishing labor and materials for Earthwork and Structures, Part 2 of Block 18 Laterals and Wasteways, East Low Canal Laterals, Columbia Basin Project, Washington. Location near Connell, Washington. Principal items are 241,000 cu. yds. excavation; 1,370 cu. yds. concrete in structures; 5,680 lin. ft. concrete pipe; furnishing and installing 14 pumping units and piping; and other work. Completion time 26 days. For particulars, address Bureau of Reclamation, P. O. Box 368, Ephrata, Washington, or Building 53, Denver Federal Center, Denver 2, Colorado. W. A. Dexheimer, Commissioner.

United States Department of Commerce, Bureau of Public Roads. May 10, 1956. SEALED BIDS will be received at the office of the Inter-American Highway Office, Bureau of Public Roads, Room 4009, General Services Administration Bldg., Washington 25, D. C. until 2 p.m., e.d.t., June 14, 1956 for the construction of approximately 21 miles of grading, drainage, and selected borrow base on the Inter-American Highway in Honduras between Jicaro Galan and the Nicaragua border. Bidders will be limited to United States or Honduras firms with a satisfactory record of performance on construction in the United States or in the Republic of Honduras. The approximate quantities of the major items of work are: Unclassified excavation 362,000 cu. meters, Unclassified borrow 224,000 cu. meters, Selected borrow base course 120,000 cu. meters, Class "A" concrete in box culverts, 1,360 cu. yards, Reinforcing steel in box culverts 155,000 lbs., Nestable bituminous coated corrugated metal pipe culvert 6250 feet (24" to 60"). All materials, equipment and supplies used in the construction of this project must be products of the United States or of Honduras unless otherwise authorized. Bureau of Public Roads Specifications FP-41 will apply. Plans, Specifications, and Proposal Forms are available upon request at the above address, or at the Inter-American Highway District Office, Bureau of Public Roads, Room 212, Banco Atlantida Bldg., Calle Colon, Tegucigalpa, Honduras, mailing address Apartado 165. C. D. Curtiss, Commissioner.

EMPLOYMENT OPPORTUNITIES

The Advertisements in this section include all employment opportunities—executive, management, technical, selling, office, skilled, manual, etc.

Positions Vacant | **Civil Service Opportunities . . .** | **Employment Agencies**
Positions Wanted | **Selling Opportunities Wanted** | **Employment Services**
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Send NEW ADS and inquiries to Classified Advertising Division of ENGINEERING NEWS-RECORD, 330 W. 42nd St., N. Y. 36, N. Y.

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Please send resume and salary requirement to Industrial Relations Department Head

GRACE CHEMICAL CO.
Division of W. R. Grace & Co.
P. O. Box 4906 Memphis, Tenn.

AUTOMOTIVE ENGINEER
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Recent graduate with limited or no experience. For company's training program in Saudi Arabia.

Salary commensurate with education and experience. Write outlining personal history and work experience.

Recruiting Supervisor, Box 137
ARABIAN AMERICAN OIL COMPANY
505 PARK AVENUE, NEW YORK 22, N. Y.

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Worldwide Engineering & Construction org'n in N. Y. City

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Send resume stating education, experience and salary requirements. All replies confidential.

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Prefer several years' experience in bridges, buildings, highway structures or hydro structures. Will consider lesser experience with good educational background.

We are professional engineers and desire men who wish long range employment with good opportunity to advance and develop in professional engineering. Occasional openings in construction supervision and inspection.

Paid vacation, sick leave, holidays, overtime. Employee Benefits Plan furnishes retirement income and insurance. Blue Cross. Moving allowance. Openings available in St. Louis and San Francisco.

Please write fully to

SVERDRUP & PARCEL, INC.
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WANTED
Structural Steel Detailers and Checkers for Expanding Structural Steel Fabricating Company in Eastern Ohio.

Good rate plus overtime for experienced men. Send experience history, references, availability and salary wanted in first letter.

Reply to:

P-1628, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

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MASTER MECHANIC
For Chicago contractor. Complete line of equipment. Must be proficient in shop management, field set-ups, and records keeping.

P-1645, Engineering News-Record
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Resident Engineer, Field Engineers, Designers and Draftsmen. Pleasant working conditions. Interesting projects. Qualified graduates may apply in person or write fully stating education and experience.

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P-1540, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

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Hydraulic Engineer experienced in Earth and Concrete Dam Design

Soils Engineer Experienced in Embankment Design of Dams—Slip Circle Analysis

Sanitary Engineer experienced in Design of Sewage Disposal and Industrial Waste Plants

Send Complete Resume in First Letter to

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Gannett Fleming Corddry & Carpenter, Inc.
Box 366, Harrisburg, Pa.

HIGHWAY ENGINEERS for work in New Jersey and New York

Designers, draftsmen, chiefs of party, specification writers — submit complete resume stating education, experience, salary desired and date of availability to

P-1603 Engineering News-Record
330 W. 42 St. New York 36, N. Y.

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Chicago 6, Ill.

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P-1681, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

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SALUDA, VIRGINIA

MECHANICAL EQUIPMENT SPECIALIST

Graduate Mechanical Engineer with a minimum of 7 years' experience in the selection, design, operation and maintenance of heavy industrial mechanical equipment. This includes Diesel engines, compressors, pumps, turbines, and other related machinery for oil refinery, power plants and oil producing facilities. Good industrial contacts required. For New York Engineering Department, but job requires occasional travel to Europe and the Middle East.

Salary commensurate with experience and training. Liberal benefit program. Write outlining personal history and work experience.

Recruiting Supervisor, Box 112

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Permanent positions for structural draftsmen having at least three years experience, with structural steel fabricators, on bridge and building work. Modern air-conditioned office with all employee benefits.

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POSITIONS VACANT

Civil Engineer. Prefer 5 to 10 years experience in design and details of sewer and water systems, drainage and grading, street work, municipal engineering. For Midwest consulting firm. Salary $6,000-$8,000 plus overtime and benefits. Sverdrup & Parcel, Inc., Engineers-Architects, 915 Olive, St. Louis 1, Mo.

Engineers experienced in design and supervision of construction to work as resident engineers or prepare plans for water and sewer sytsems. State experience, age, salary required, when can report, and give references. Reply P-9290, Engineering News-Record.

POSITIONS VACANT

Soils Engineer. Soils work in connection with foundations of bridges, buildings, highway and miscellaneous structures, also testing and control of placement of earth fills for highway and railway project. Prefer associated ability in civil or structural design engineering. For Midwest consulting firm. Salary $6,000-$8,000 plus overtime and benefits. Sverdrup & Parcel, Inc., Engineers-Architects, 915 Olive, St. Louis 1, Mo.

Bridge Designers — Highway Department — Mountain West. Permanent positions in new office building, 5 day week. Starting $510 up. Paid vacations, sick leave. Retirement program. Hospitalization optional. Employee rating system with periodic advancement based on merit. Opportunity to work on all phases of bridge design from hydraulics to completed structure. Include summary of education, experience, personal history, references. Write: Personnel, Wyoming Highway Department, Box 931, Cheyenne, Wyoming.

Engineers one or two years experience in structural design or recent graduates. Consulting engineers office Newark, N. J. Give education, experience and salary. P-8800, Engineering News-Record.

Civil Engineer with several years experience in site work including design of roadways, parking lots, sewers, sewage disposal systems, etc. Permanent connection. Eberle M. Smith Associates, Inc., architects-engineers, 153 East Elizabeth Street, Detroit, Michigan. Woodward 5-8180.

General Superintendent—Who is now superintendent engineer and wants to take next step up with growing N. J. organization. P-1579, Engineering News-Record.

Office Engineer—Civil, 2 years construction experience, estimating, checking details, job coordinator, expediting, etc. North New Jersey. P-1576, Engineering News-Record.

Wanted Grade Foreman familiar with all types of excavation and pipe work. Work in central New York. Good opportunity. Experience-references. P-1595, Engineering News-Record.

Civil Engineer, preference given to man with Illinois, County, Township or Federal Aid Secondary, survey, design or construction experience or equal. Position permanent, good working and living conditions. Give education, experience and salary expected. Hancock County Highway Department, Carthage, Illinois.

Municipal Engineer: Wanted to be in charge of the Engineering Division of the Public Works Department for the Town of Fairfield, Connecticut. Salary range from $7100 to $9100. Applicant should have at least three years experience in municipal sanitary, storm water and street design and layout. Please state full qualifications, experience, references. Apply to Town Engineer, Town of Fairfield, 608 Jennings Road, Fairfield, Connecticut.

Civil Engineer: For the Engineering Division of the Public Works Department for the Town of Fairfield, Connecticut. Salary range from $5500.00 to $6900.00. Applicant should have a minimum of two years general municipal engineering work. Please state full qualifications, experience, references. Apply to Town Engineer, Town of Fairfield, 608 Jennings Road, Fairfield, Connecticut.

Engineering graduate for position of assistant to Chief Engineer of old New England engineering organization on specifications and design of airfield pavements and structures in New England. Give full details of experience and education. Salary $7200.00 per year. P-1562, Engineering News-Record.

Civil Engineer—One desired immediately by the City of Birmingham, excellent opportunity, work varied and interesting. Starting salary $4966 per yr., 40-hr. week and liberal vacation, sick leave, holiday, group insurance, social security and retirement benefits. Must be college graduate in civil engineering; experience desirable but not necessary. Submit complete written application to Asst. City Manager—Birmingham, Michigan.

Superintendent—with engineering background —to become associated with a growing excavating-paving and flood control contractor in Western New York. As field superintendent the right man can build his own future. Sheridan Construction Corp. 3580 Sheridan Drive Buffalo 21, New York.

(Continued on page 128)

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TOWN OF NATICK

Applicants must be graduate C.E. or have 2 years Engineering College or equivalent and experience in Field Engineering, construction, inspection, and surveying in connection with Highways, Water and Sewer Systems. Administration experience in Engineering Office desirable. Salary Range $4830 to $5310. Vacations. Insurance (life plan.) Retirement System. Applications will be received in the Office of the Director of Public Works, Mr. Walter F. Burdick, 44 Middlesex Avenue, Natick, Massachusetts.

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EMPLOYMENT OPPORTUNITIES

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Assistant City Engineer: City of Owosso, Mich. Must be a graduate civil engineer or man with considerable experience in surveying and drafting, with some design knowledge for general municipal engineering. Submit complete resume with salary requirements and earliest date available in first letter to City Engineer, Owosso, Michigan.

Reinforcing Steel Detailers for established firm in New York City and other desirable Eastern locations. Send resume of experience and salary requirements. Replies confidential. P-1625, Engineering News-Record.

Senior Cost Engineer familiar with the Uniform System of Accounts for Electric Utilities. Duties wil consist of analyzing complete major construction projects for an Electric Utility. Experience with the Federal Power Commission or a State Public Service Commission would be desirable. Some experience with the Property Record Department of any Electric Utility would also be an asset. Indianapolis Power and Light Company, Employment Department, 1230 West Morris St., Indianapolis, Indiana.

College Instructor—Young engineering graduate. Some industrial experience desirable. Opportunity to work on advanced degree. Write: Head, Department of Engineering Drawing, Iowa State College, Amiss, Iowa.

Field Superintendent Building Construction general contractor engaged in public work in Southern New Jersey and New York City area. Send resume and salary requirements to P-1666, Engineering News-Record.

Project Engineer with estimating ability and management potential for main office of Midwestern General Contractor, permanent position with growing organization. State experience, age, salary, when can report and references. P-1668, Engineering News-Record.

Building Construction Superintendent for Midwest General Contractor in heavy industrial and institutional construction; growing organization. State experience, age, salary, when can report and references. P-1671, Engineering News-Record.

Designers & Draftsmen experienced in all types of municipal work. Send resume, availability, and salary requirements to City Engineer, Waco, Texas.

POSITION VACANT

Sales Engineers to introduce outstanding product in sanitary and drainage fields. Young, aggressive, well-financed company. Salary open. Location: Gulf Coast. P-1689, Engineering News-Record.

POSITIONS WANTED

Chief Structural Engineer buildings—single and multistorey foundations, civil and waterfront work location New York City. PW-1425, Engineering News-Record.

Civil Eng. Reg. 28 yrs. old with experience in const. of roads, sewers, foundations, earth work, steel and masonry work. Now employed as Asst. project mgr. on large const. job. Wants job with contractor as supt. or assistant. PW-1604, Engineering News-Record.

Chief Engineer fabrication of piping, pressure vessels, codes, estimating, negotiating, supervision of personnel. Project Engineer design, construction chemical and petro plants. Age 41, New Jersey P.E., domestic or foreign. PW-1572, Engineering News-Record.

Maintenance Superintendent, over 20 years experience on construction equipment, desires connection in charge of maintenance dept., thoroughly versed in preventive maintenance and economics. PW-1608, Engineering News-Record.

Civil Engineer 43. 22 years responsible charge multi-million dollar commercial and industrial projects, including sewers, treatment plants, tunnels, power plants, etc. 1st, as owner's resident, later as superintendent and finally as project manager for contractor. Now consultant's project design engineer on large sewer projects. Desires permanent position where top man is required. Salary 12,500. PW-1629, Engineering News-Record.

Building Construction Supt. Over 25 years experience on industrial, commercial, institutional, large scale housing, churches etc. desires position with reliable organization as field superintendent, will travel. PW-1655, Engineering News-Record.

Civil Engineer, 28, reg. PE several Eastern States, exp. in bridge desn., prestressed conc. Seeks respons. design or admin. posn. with consultants or contractor. PW-1686, Engineering News-Record.

POSITIONS WANTED

Building Estimator, 27, 2 yrs. experience with general contractor, 4 yrs. field experience as Mason. Married, vet., college grad—degree in construction. Seeks responsible position with opportunity to advance with general or masonry contractor. Prefer Eastern location. PW-1643, Engineering News-Record.

C.E. exp'cd as survey crew chief, drafting supervisor, designer hwy intr'chgs, 5 yrs, as coll. instr. PW-1663, Engineering News-Record.

City Engr., reg., 8 yrs. municipal, 5 yrs construction experience, desires relocation to NW States. PW-1664, Engineering News-Record.

General Superintendent with experience on large industrial & commercial building construction work, desires position assuming complete charge of a general contractors field operations, or several building projects—apply PW-1667, Engineering News-Record.

Soil mechanics major, B.S.C.E., M.S.E., age 26, LTJG Civil Engineer Corps, USN, completing 3 yrs. active duty. Desires position with consulting or soils testing firm. Locate anywhere. PW-1685, Engineering News-Record.

Civil Engineer, seven years construction experience in field, office, and design. Employed as project engineer for contractor. PW-1687, Engineering News-Record.

General Foreman or Assit Supt. available immediately 25 years experience heavy construction subway, tunnel roadwork. Also concrete foundation, underpining shoring utilities. PW-1688, Engineering News-Record.

Soils and Materials engineer — M.S. (soil mech.); M.S. (highway engg.), regd. P.E. (Ill.), single about 38 years. Over six years office and field experience. Completing a job as chief, soils section (and in charge soil testing lab.) for a firm in Chicago. Present emoluments around $9,000 year. Any location with suitable compensation. PW-1598, Engineering News-Record, 520 N. Michigan Ave., Chicago 11, Illinois.

SELLING OPPORTUNITY WANTED

Engineer, Technologist, retired, would represent, Long Island, Manufacturers, dealers, engineers. RA-1474, Engineering News-Record.

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PS-1664, Engineering News-Record

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Good News From Baghdad

The Middle East has taken up so much news space recently with depressing accounts of unresolved crises that it is heartening to call attention to a happening with a happy ending. It concerns a flood, which threatened Baghdad, but was controlled and turned away by some new engineer-built facilities. Indeed they are so new that they were only dedicated a week before the floods bore down. They are a part of the great development program being carried out by the Iraq government with its oil concession income—a program that should be, and probably is, the envy of every other Middle Eastern country.

Spring floods in the parallel valleys of the Tigris and Euphrates Rivers are as regular as Spring itself, but never before has there been any sense of security from the overflows. Less than 20 miles of almost level land separate the two streams, and the overflows have frequently topped Baghdad's levees.

The highest floods on the Euphrates always spilled over into a normally dry desert depression called Lake Habbaniya, thus affording some relief, and it is this phenomenon which has been exploited by engineers to cut the crests of all floods, big or little. A gated dam (Ramadi Barrage) and a diversion channel do the trick. And over on the Tigris a similar setup, involving a dam at Samarra with a diversion channel into another desert depression, Wadi Tharthar, keeps that stream's floodwaters from reaching Baghdad.

It was these two diversion schemes which were dedicated during Iraq's recent Development Week, a festival that could well be made an annual event since many other public works projects are still under way as a part of the overall program. British engineers aided the Iraqis on the diversion projects, and a British consulting firm is in charge of the design and construction of a 400 ft arch dam on one of the Tigris tributaries, at Dokan, where the reservoir will provide substantial flood control and irrigation storage.

But American engineers are also active on some of Iraq's other projects. For example, high dams on two other Tigris tributaries, at Derbendi Khan and Beklime (a 540 ft heavy buttress type), are being handled by the Harza Engineering Co. Moreover, in planning the overall program, the Iraq Development Board, which includes one British and one American engineer among its members, also used an American consulting firm, Tippetts-Abbett-McCarthy-Stratton. And among U. S. contractors are J-A-Jones, Charles Tomkins and Tecon.

Nor are flood control and irrigation the only goals of Iraq's development program. Housing is soon to be emphasized, and it is understood that the Rockfeller's Ibec Housing Corp. has already been welcomed as a partner in this enterprise.

This use of foreign engineering aid, to supplement Iraq's inadequate design and construction forces, is largely responsible for that country's progress relative to some other Middle East nations, where such aid is sometimes regarded as inconsistent with national pride. Iraq will not only have its big basic projects earlier, but in the process will have developed the competence of its own technicians to the point where they can do many more things themselves.

The good news from Baghdad is not only that a flood was averted, but that this ancient land of Mesopotamia is well on its road to a higher standard of living for all of its people.

Highway Challenge Nears

Congratulations are in order for the 388 members of the House of Representatives who voted in favor of the Fallon Bill and sent that much-needed highway measure on to the Senate for action.

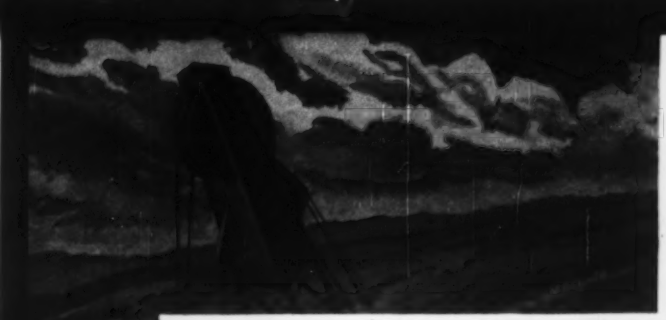
The cardinal point for the nation as a whole is that at long last a long-range highway bill is really on its way through Congress. There may be some flaws in it, but the general outlines of the measure seem to be sensible equitable, and designed to get an adequate highway program moving. It should be passed.

Aid in the likelihood that the Senate will move fast to put its stamp of approval on the bill, a major job will face the construction industry. For after years of debate, of fact gathering, of analysis and some forward planning, the actuality of a huge, concentrated highway building program is now very much ahead. The construction industry, in all its parts, must start, right now, to gear itself to that program.

Figures are so often quoted these days that they lose some of their impact. But one on the highway program is worth repeating as a measure of the size of the job that must be tackled. In 1955, government units in the United States spent a total of $7.25 billion for highway construction and maintenance. It is estimated that the $51-billion, 13-year program as envisioned in the Fallon Bill would raise expenditures to $8-billion in the first year of its operation, and to close to $10 billion yearly after five years had gone by.

Fortunately the studies of highway designing and construction capability, made by special task forces of the American Road Builders Association, reveal no shortages in men, materials or machines that can't readily be remedied. Actually, a sizeable increase in work could be handled now.

Nevertheless, there are problems of organization, of design standards, of contract letting and of new federal-state relationships that demand attention and quick solution. The construction industry can't afford—and neither can the nation—to be caught short of ability to produce in answer to the challenge that the new highway program will pose.



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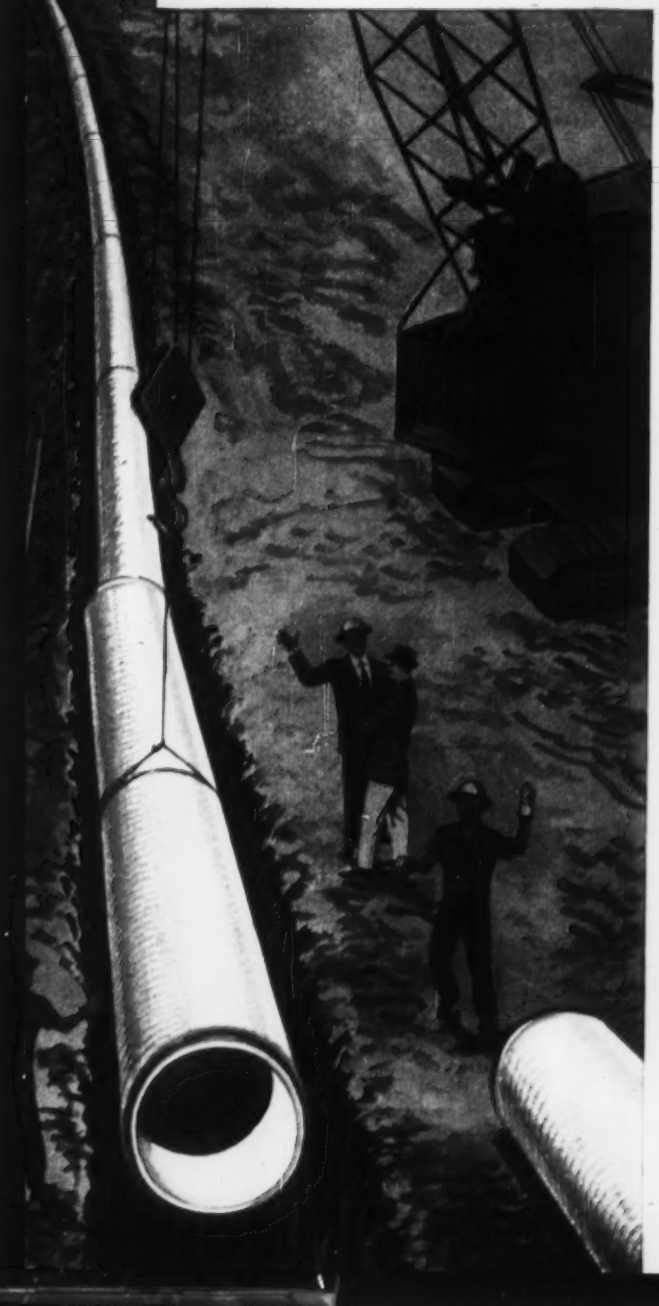

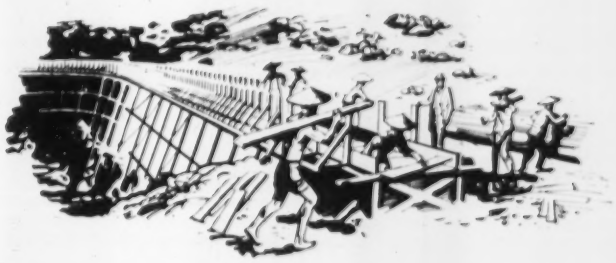

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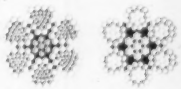

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